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THE KOPPERS CO.

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on the operation of
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Engineering Reports and Financial Statements Prepared
Coals Analyzed and Tested

THE KOPPERS COMPANY

PITTSBURGH, PA.

THE IRON TRADE REVIEW

Vol. LXVI Cleveland, March 11, 1920 *No. 11*

Mill Production Still Held Back

Reduced Output Neutralizes Any Conservatism In Buying and Material Scarcity Remains Intense—Automobile Builders Bid Up Sheet Bars To Fancy Heights—Leading Wire Interest Sells At Prices To Be Fixed at Delivery

A MORE conservative attitude exhibited by certain classes of buyers as to obligating themselves at current prices, continues to be offset by the barriers placed around iron and steel production by various factors. The most effective of these relate to cars and fuel. The general situation in this respect has grown both better and worse in spots. The Mahoning valley, where some plants are running under 50 per cent, still shows the most aggravated condition and Chicago's position is less favorable this week. At Pittsburgh and in eastern Pennsylvania outputs are being restored. It is authoritatively estimated that strikes and shortages of fuel and steel have cost an output of 500,000 tons of sheets. This represents 73 days' working capacity of 20 per cent of annual output.

Whatever spirit of caution among steel buyers is shown in the present market, it does not apply to automobile builders. Bids by these interests for material for early shipment appear almost without limit. Two of the principal Detroit builders unable to get sheets of automobile quality in the open market have paid $90 and $92 Pittsburgh for 3000 to 5000 tons of prompt open-hearth sheet bars each, which are being turned over to certain mills for conversion. Some tonnage of open-hearth sheet bars for April delivery also have been sold this week direct to sheet mills rolling high grade stock. Generally sheetmakers will not pay anything approaching these prices. With bessemer sheet bars which are not suitable for automobile specifications selling at $70 Pittsburgh, an unheard spread of $20 from open-hearth steel has been created. For new construction at Cleveland presumably connected with the automotive industry, a company is arranging to buy 1500 tons of material from warehouse stocks.

Can't Supply Railroads

All steelmakers are disposed to favor the railroads with material as quickly as they can supply it under their present congested condition and at the most attractive price, as a matter of good business policy. How to squeeze out by a reasonable date, sufficient tonnage in the assorted forms necessary for a large equipment program, however, is a big problem. The leading western mill is unable to deliver car steel before August and this does not include steel bars on which capacity is booked to the year-end. This situation apparently is holding back car orders for while inquiries of this kind remain heavy, awards are few relatively. It is estimated 100,000 box cars now on the rails are in need of repairs and these will call for 30,000 tons of sheets alone. The Illinois Central is seeking 40,000 tons of rails for 1921.

Sales Policy Modified

The first modification of the Steel corporation policy pursued since last March of quoting minimum prices has come through the American Steel & Wire Co. which now is taking business for a limited period ahead with prices to be fixed at time of delivery. This is a form of selling which various producers have been resorting to recently and these settlements invariably have been at higher levels. Otherwise the Steel corporation still is naming minimum prices but it has nothing to offer for many months. A case in point is the fact that the Illinois Steel Co. now is sold out entirely on steel bars for 1920.

Iron Prices Are Firm

Further developments have tended to establish the brokerage character of most of the recent transactions in early basic iron at Pittsburgh at the reduced figure of $41.50 valley, although one valley maker accepted 1500 tons on that basis. Simultaneous and subsequent sales of basic by makers direct have demonstrated that $43 valley basis still is the going market figure. Basic iron remains scarce. Foundry iron also continues firm at $42 valley. New sales on this or the equivalent basis in the week were not less than 20,000 tons. The iron market generally is strong.

First official statistics of French steel production to be put out since the armistice and just received by THE IRON TRADE REVIEW show a total of 1,004,518 metric tons of ingots and castings for the first six months of 1919. This is more than 50 per cent below the yearly prewar rate but the comparison is even less favorable since the late figures include the output of the former German plants in Lorraine.

MARCH 11, 1920

THE IRON TRADE REVIEW

A weekly publication devoted to the Iron, Steel, Foundry and Metal-working Industries

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Necessity Brings Co-operation

PRECEDENT has little weight these days, is an expression that is becoming almost commonplace, but nowhere is the truth of this observation shown more clearly than in the growing relations between competing manufacturers. During the war the government urged all essential industries to co-operate for a definite purpose. At times competitors in the same industry were compelled to co-operate when they had no desire to do so. At the end of the war it was generally believed that the good that had resulted from this form of mass action would be so well established that American industries voluntarily would agree to work for a new age in business.

Individual hostility and natural trade suspicions, however, were obstacles too serious to be overcome within a year or two. In export trade the real beginning of co-operation has been noted. The Webb-Pomerene law, permitting the combination of producers to engage in exporting may not have been that inspiration to co-operative action that the framers of the law anticipated it would be. It has remained for the common necessities and problems of exporters to bring the spirit of co-operative action into play.

With the falling of the exchange and the cessation of Europe to purchase, many export houses have been threatened with a cutting off of the bulk of their trade. Some, it is rumored, face serious finacial trouble. All are more or less embarrassed. It was this unfavorable outlook that prompted a special meeting at New York of the American Manufacturers' Export association last week at which time a proposal was made for a gigantic scheme of co-operation. The proposal was made to have all exporters throw their resources into one pool and establish of their own initiative a system of bartering whereby foreign trade with foreign countries could be continued. That the scheme has as yet failed of fruition is of little consequence. The incident is merely a proof of the fact that American industry is in a new era and that the individuals engaged in it are being converted to the belief that after all co-operation may not be a bad thing, and that senseless competition may be harmful.

Senate Has Chance to Help

PROBABLY in answer to the call for economy, or more likely because no political harm can come from their act, the members of the house of representatives in the legislative bill just passed, have cut $44,500 from the funds available during the fiscal year of 1920-21 for the work of the metallurgical division of the United States bureau of standards. This reduction not only abolishes the statutory positions of the chiefs of two important sections, but also necessitates discharging approximately 20 persons from the present too small scientific and technical staff of 47. In abolishing the statutory positions, the house deprives the bureau of the services of J. R. Cain and H. S. Rawdon, men widely known for their ability and resourcefulness in metallurgical research. The loss of these men, together with nearly half of the present staff would practically disrupt the organization of the metallurgical division.

Such a misfortune would seriously affect not only the work being done exclusively by the bureau, but also the considerable amount of valuable research being conducted by the bureau in co-operation with other organizations, including the large engineering societies, universities, and industrial concerns. One of the most important of the many investigations which will be curtailed unless congress revises its appropriation is that devoted to a study of the effect of sulphur and phosphorus in steel. The bureau is just beginning an exhaustive investigation on this subject in co-operation with manufacturers, technical and scientific organizations and consumers of steel. The problem is of tremendous economic importance and involves possibilities of saving millions of dollars annually in the cost of producing steel by revising specifications.

To cut short the valuable work being performed by the metallurgical division because of lack of funds would be folly. It is a sad commentary upon

the functioning of the lower house of congress that the bureau of standards, which with the bureau of mines perhaps more than any other government institution has won the respect and admiration of the industrial interests of the country, should be made the scape-goat of pork barrel politics. Fortunately the senate has an opportunity to revise the bill and to restore to the division of metallurgy the funds required for the continuance of the valuable work in which it is engaged. The members of the upper branch of congress should see to it that the injustice imposed by the bill is rectified. Any appropriation commensurate with the needs of the bureau will be repaid many times over by the results of the research made possible by it.

Industry Needs Mechanical Aids

IF THE manufacturers of conveying equipment have been entertaining any apprehension that their industry is greatly overcrowded, they heard much to comfort them at the recent annual meeting of the Material Handling Machinery Manufacturers' association. Unless there is some development little short of a national calamity, the satisfactory business of the past several months not only promises to be maintained, but, according to all indications, will increase as time goes on. Particularly interesting in this connection was data submitted by A. J. Barnes following a recent survey of the field for mechanical handling equipment under auspices of the association.

He presented figures showing that there is a potential and actual demand for 214,464 units in the industrial field alone, such items being referred to as industrial trucks, tractors, lift trucks, industrial locomotives, portable cranes, portable conveyors and detached electric hoists. The investigation also demonstrated that only 5 per cent of the plants in the country are extensively employing machines of the types mentioned. It further disclosed that but 35 per cent of the manufacturers are familiar with mechanical handling equipment and its function, and that the remaining 65 per cent are entirely unfamiliar with the details of even the minor types of such machines. In the iron, steel and metalworking industry, 30 per cent of the manufacturers, it was brought out, could not mention a single manufacturer of plant transportation equipment, such as trucks, tractors, conveyors, etc. Furthermore, it was brought out at the meeting that the potential requirements of the railroads are enormous. At a terminal installation in Cincinnati, approximately 90 cranes and 360 electric hoists are in operation.

Aside from the significance of these data to the manufacturers of material handling machinery, the apparent indifference of the proprietors of many factories to the advantages of this equipment, especially its demonstrated possibilities for labor saving, constitutes an element of danger to the economic life of the nation's industries. If it is true that 65 per cent of the manufacturers are unfamiliar with the use of material handling machinery, it necessarily follows that many thousands of workmen are employed on work which could be performed more economically by machinery. This is a condition which should be corrected at once. The remedy is labor saving machinery which *actually* saves labor.

Promoting Good Citizenship

A MOVEMENT which is hoped by its sponsors will develop nationally, to stimulate interest of business men in public affairs as the surest means of suppressing lawlessness and preventing the enactment of class legislation against the business interests of the country is worthy of serious attention. The movement is particularly timely with the national elections approaching and the American Federation of Labor issuing appeals to workingmen to vote only for those candidates for office who will pursue a friendly course toward union labor. It is appropriate because a great many of the most radical elements in the country, who have no political parties of their own, may unite in supporting the trade unions' candidates. If the organized advocates of class legislation are to conduct a campaign in an effort to dominate the public officials, it is proper that business men meet the issue squarely and prepare to present their case fairly to the voters who will decide it. Organized labor has complained for years against business interests participating in political campaigns, while attempting to do so itself; and now it remains to be seen whether it can lead the workingmen of the country more successfully than it has in the past.

Back of the new movement was a little incident which caused the business men of California to organize, the Commercial Federation of California being the progenitor of the general body now being formed. A committee including some of the most prominent business men in the state went to the capitol to protest against a proposed bill. Arriving at the capitol they observed much to their chagrin that the labor leaders were on close terms with the legislators while they themselves did not even have an acquaintance. They decided something was wrong, and what was wrong was their disinterest in public affairs—they had not given sufficient thought to electing the right kind of representatives, men whom they knew and could trust.

The extent and scope of the new movement remain to be determined, but nevertheless it has a logical field in promoting public understanding of men and measures, and thereby aiding the cause of good citizenship.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 814 AND 818

Pig Iron

Bessemer, valley	42.00
Bessemer, Pittsburgh	43.40
Basic, valley	43.00
Basic, Pittsburgh	42.90 to 44.40
Basic, delivered, eastern Pa.	42.00 to 43.00
Malleable, valley	44.00
Malleable, Pittsburgh	45.40
Malleable, Chicago, furnace	43.50
Malleable, Buffalo, furnace	45.00 to 46.25
Malleable, delivered eastern Pa.	46.00 to 47.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern delivered Phila.	$46.60 to 47.10
No. 1X, Buffalo	46.75 to 48.00
No. 1 foundry, Chicago, furnace	45.25
No. 2 foundry, valley	42.00 to 43.00
No. 2 foundry, Pittsburgh	43.40 to 44.40
No. 2 foundry, Buffalo	43.75 to 45.00
No. 2 foundry, Buffalo, Boston del.	46.90 to 47.90
No. 2X, Buffalo, Boston del.	48.15 to 50.15
No. 2 foundry, Chicago furnace	43.00
No. 2 foundry, Ironton furnace	42.00 to 45.00
No. 2 foundry, Cleveland furnace	43.00
No. 2X, eastern, del., Phila.	45.35 to 46.10
No. 2X, eastern, N. J., tidewater	45.35 to 46.10
No. 2X, Pennsylvania, Boston del.	48.15 to 49.15
No. 2 foundry, Pa., Boston del.	46.90 to 47.90
No. 2X, foundry, Buffalo furnace	43.25 to 46.25
No. 2 foundry, del., Philadelphia	44.10 to 45.10
No. 2 foundry, N. J., tidewater	44.10 to 45.10
No. 2 southern, Birmingham	40.00 to 42.00
No. 2 southern, Cincinnati	41.60 to 43.60
No. 2 southern, Chicago	45.00
No. 2 southern, Phila.	43.50 to 44.50
No. 2 southern, Cleveland	45.00 to 47.00
No. 2 southern, Boston (on dock)	45.75 to 46.75
No. 2 southern, St. Louis	44.30 to 47.35
No. 2X, Virginia, furnace	43.25
No. 2X, Virginia, Philadelphia	47.35
No. 2X, Virginia, Jersey City	47.65
No. 2X, Virginia, Boston	47.95
Gray forge, valley, Pittsburgh	42.40
Gray forge, eastern Pa.	43.00
Silveries, 8%, furnace	53.00 to 55.00
Ohio Silveries, 8%, Chicago	56.30
Tennessee Silveries, 8%, Chicago	56.30
Low phos. standard, Phila.	53.80
Low phos. Lebanon, furnace	47.00
Low phos. stan. valley del., Pitts.	49.40 to 50.40
Charcoal, Superior, base, Chicago	57.50

Coke

(At the ovens)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Pocahontas furnace	8.00
Pocahontas foundry	8.00
New River foundry	8.00
New River furnace	8.00
Wise county furnace	7.25
Wise county foundry	8.25

Ferroalloys

Ferromanganese, 80 per cent, delivered, domestic metal	$160.00 to 225.00
Ferromanganese, 80 per cent, English c.i.f. Atlantic ports	155.000 to 165.00
Spiegel, 18 to 22 per cent furnace spot	57.00 to 60.00
Ferrosilicon, 50 per cent, spot and contract, delivered	80.00 to 85.00
Ferrotungsten, standard, per pound contained, furnace	90c to 1.10
Ferrochrome, 60 to 70 per cent chromium, 6 to 8 per cent carbon, per pound contained, maker's plant	19c to 20c
Ferrovanadium, 30 to 40 per cent per pound contained, according to analysis	$6.00 to 7.00
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer, ferrosilicon, 10 per cent	62.50 to 64.50
Bessemer, ferrosilicon, 11 per cent	65.80 to 67.80
Bessemer, ferrosilicon, 12 per cent	69.10 to 71.10

Prices at Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

(4 x 4 inch)

Open-hearth, Pittsburgh	65.00 to 70.00
Open-hearth, Youngstown	65.00 to 70.00
Open-hearth, Philadelphia	64.10
Bessemer, Pittsburgh	65.00 to 70.00
Bessemer, Youngstown	65.00 to 70.00
Forging, Pittsburgh	75.00 to 80.00
Forging, Philadelphia	74.10

SHEET BARS

Open-hearth, Pittsburgh	$70.00 to 80.00
Open-hearth, Youngstown	70.00 to 80.00
Bessemer, Pittsburgh	70.00 to 80.00
Bessemer, Youngstown	70.00 to 80.00

SLABS

Pittsburgh and Youngstown	65.00 to 70.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$52.00 to 70.00
Grooved skelp, Pittsburgh	3.25c to 4.00c
Sheared skelp, Pittsburgh	3.45c to 4.00c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pittsburgh	3.00c to 4.00c
Structural shapes, Philadelphia	2.70c to 4.25c
Structural shapes, New York	2.72c to 4.27c
Structural shapes, Chicago	2.72c to 2.97c
Tank plates, Pittsburgh	2.65c to 4.50c
Tank plates, Chicago	2.92c to 3.17c
Tank plates, Philadelphia	2.90c to 4.25c
Tank plates, New York	2.92c to 4.27c
Bars, soft steel, Pittsburgh	3.00c to 4.75c
Bars, soft steel, Chicago	2.62c to 2.87c
Bars, soft steel, New York	2.62c to 4.27c
Bars, soft steel, Philadelphia	2.60c to 4.25c
Bar iron, common, Phila.	3.75c to 4.25c
Bar iron, common Chicago	3.50c to 4.00c
Bar iron, common, Cleveland	3.75c
Bar iron, common, New York	3.77c to 4.27c
Bar iron, common, Pittsburgh	4.50c
Hard steel bars, Chicago	3.25c to 3.50c

Rails, Track Material

Standard bessemer rails, mill	$45.00 to 60.00
Standard open-hearth rails, mill	47.00 to 62.00
Relaying rails, light, St. Louis	52.00 to 55.00
Relaying rails, Pittsburgh	45.00 to 50.00
Angle bars, Pittsburgh base	3.00c to 4.00c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	3.00c to 3.50c
Spikes, railroad, Pittsburgh	4.00c to 4.25c
Track bolts, Pittsburgh	6.00c to 6.50c
Track bolts, Chicago	4.62c
Track spikes, Chicago	3.62c
Tie plates, Chicago	2.75c to 2.90c

Wire Products

(100 lbs. to jobbers, carloads; retailers, 5c more)

Wire nails, Pittsburgh	$3.25 to 4.00
Plain wire, Pittsburgh	3.00 to 3.50
Galvanized wire, Pittsburgh	3.70 to 4.20
Barbed wire, painted, Pittsburgh	3.40 to 3.90
Barbed wire, galvanized, Pitts.	4.10 to 4.60
Cut nails, Pittsburgh, l. c. l.	6.195
Coated nails per count keg, Pitts.	2.85c to 3.35c
Polished staples, Pittsburgh	3.40 to 4.25
Galvanized staples, Pittsburgh	4.10c to 4.95c

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Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	6.25c
Sheet piling, base, Pittsburgh	2.55c to 3.65c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 8.50c to 9.00c.

Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 9.00c
No. 28, bessemer, Pitts.	4.35c to 9.00c
No. 28, open-hearth, Chi.	4.62c to 8.27c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 5.50c
No. 28, bessemer, Pitts.	4.35c to 5.50c

GALVANIZED

No. 28, open-hearth, Pitts.	5.70c to 9.65c
No. 28, bessemer, Pitts.	5.70c to 9.65c
No. 28, open-hearth, Chi.	5.97c to 8.92c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.55c to 7.50c
No. 10, bessemer, Pitts.	3.55c to 7.50c
No. 10, open-hearth, Chi.	3.82c to 6.77c
No. 10, open-hearth, Phila.	3.80c to 5.25c

Full sheet schedule page 818.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.00

Iron and Steel Pipe

Base Pittsburgh to Jobbers Carloads

Base, Pittsburgh	Black Per cent off	Galv. Per cent off
⅜ to 3 in., butt, steel	54 to 57½	40½ to 44
⅜ to 3 in., butt, iron	34½	18½

Full pipe schedule page 818.

Boiler Tubes

Steel, 3½ to 4½ inches, c. l.	30½ to 40½
Iron, 3½ to 4½ inches, c. l.	11

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $2 higher than Class B

Four-inch, Chicago	$75.30
Six-inch and over, Chicago	72.80
Four-inch, New York	73.30
Six-inch and over, New York	70.30
Four-inch, Birmingham	69.00
Six-inch and over, Birmingham	66.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	5.00c to 5.50c
Bands, Pittsburgh	5.00c to 5.50c
Hot rolled strip steel, Pitts. stamping quality	5.25c to 6.50c
Cold finished steel bars, Pitts., base	4.00c to 5.25c

Rivets

Structural rivets, Pittsburgh	4.50c
Boiler rivets, Pittsburgh	4.60c
Rivets ⅞ in. and smaller, Pitts.	50 off

Nuts and Bolts

(Prices f.o.b. Pittsburgh)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	40–5 off
Cut thread	30–10 off
Larger and longer	30 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	40–10–5 off
Cut thread	40–5 off
Larger and longer	30–10 off
Plow bolts Nos. 1, 2 and 3 heads	40 off
Other style heads	20% higher
Stove bolts in packages	70–10 off
Stove bolts in bulk	70–10–2½ off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	60–5 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	60–5 off
Gimlet and cone point lag screws	50 off

NUTS

Hot pressed, square blank	2.00c off
Hot pressed, square tapped	1.75c off
Hot pressed, hexagon blank	2.00c off
Hot pressed, hexagon tapped	1.75c off
Cold pressed, square tapped	1.75c off
Cold pressed, square blank	2.00c off
Cold pressed, hexagon blank	2.00c off
Cold pressed, hexagon tapped	1.75c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Prices are those ruling on the largest percentage of sales, at the dates named

	Prices Mar. 10, 1920	Average prices Feb. 1920	Nov. 1919	Mar. 1919
Bessemer, valley, del., Pittsburgh	$43.40	$43.15	$32.00	$32.55
Basic, valley, delivered, Pittsburgh	44.40	43.65	30.40	30.35
*No. 2 Foundry, Val. del Pittsburgh	43.40	42.40	33.15	29.85
*No. 2 Foundry, Chicago, furnace	43.00	42.25	31.75	29.95
Lake Superior charcoal, Chicago	57.50	57.50	35.50	38.70
Malleable, valley	44.00	43.00	31.75	31.85
Malleable, Chicago	43.50	42.75	32.25	30.45
*Southern, No. 2, Birmingham	40.00	40.00	30.65	31.20
*Southern Ohio, No. 2, Ironton	43.00	43.00	31.75	29.95
Basic, eastern del., eastern Pa.	43.00	40.50	33.00	32.85
**No. 2X, Virginia, furnace	43.25	42.75	33.40	31.65
*No. 2X, eastern del., Philadelphia	45.90	45.00	35.85	35.10
Gray forge, valley del., Pittsburgh	42.40	41.40	31.80	29.60
Ferromanganese, 80 per cent, delivered	160.00	160.00	110.00	140.00
Bessemer billets, Pittsburgh	65.00	61.25	40.85	42.25
Bessemer sheet bars, Pittsburgh	70.00	65.00	45.00	45.75
Open-hearth sheet bars, Pittsburgh	70.00	65.00	45.00	45.75
Open-hearth billets, Pittsburgh	65.00	61.25	40.85	42.25
Steel bars, Pittsburgh	4.00	3.85	2.45	2.61
Steel bars, Chicago	2.62	2.62	2.62	2.81
Iron bars, Philadelphia	4.00	3.75	2.895	3.005

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

	Prices Mar. 10, 1920	Average prices Feb. 1920	Nov. 1919	Mar. 1919
Iron bars, Cleveland	$3.75	$3.75	$3.00	$3.15
Iron bars, Chicago mill	3.50	3.44	2.73	2.86
Beams, Chicago	2.72	2.72	3.07	2.89
Beams, Pittsburgh	3.25c	3.15	2.45	2.71
Beams, Philadelphia	4.00c	3.75	2.695	2.958
Tank plates, Pittsburgh	3.75c	3.70	2.65	2.90
Tank plates, Chicago	2.92	2.92	2.92	3.15
Tank plates, Philadelphia	4.25	4.25	2.895	3.155
Sheets, blk., No. 28, Pittsburgh	6.00c	6.00	4.35	4.60
Sheets, blue anld., No. 10, Pittsburgh	5.50c	5.50	3.55	3.80
Sheets, galv., No. 28, Pittsburgh	7.25c	7.00	5.70	5.95
Wire nails, Pittsburgh	4.00	4.20	3.45	3.45
Connellsville furnace coke	6.00	6.00	5.85	4.00
Connellsville foundry coke	7.00	7.00	6.95	4.80
Heavy melting steel, Pittsburgh	28.00	28.35	21.85	14.60
Heavy melting steel, eastern Pa.	26.00	25.75	20.80	14.25
Heavy melting steel, Chicago	23.50	25.00	20.60	15.25
No. 1 wrought, eastern Pennsylvania	37.50	36.15	27.85	24.00
No. 1 wrought, Chicago	29.75	30.75	26.50	17.65
Rerolling rails, Chicago	32.00	34.60	31.10	16.30

Pig Iron Market Shows Firmness

Recent Irregularity In Basic At Pittsburgh Largely Due to Brokerage Transaction—Foundry Also Strong At $42 Valley Basis As Shown By New Sales of 20,000 Tons—Some Buyers Are More Conservative

Philadelphia, March 9.—Fairly active buying featured the pig iron market in this district the past week and new inquiry is good. In low phosphorus eastern Pennsylvania consumers bought 5000 to 10,000 tons of copper-bearing iron for second quarter at $47 furnace. Another eastern Pennsylvania consumer bought 1000 tons of copper-bearing iron at the same price. Several lots of standard low phosphorus were sold at $50 furnace by one interest and another maker took some at $49 furnace. Several thousand tons of low phosphorus are expected to be closed shortly. Another 1000 tons of bessemer has been sold to Italy at $45 eastern Pennsylvania furnace and a live inquiry for 4600 tons of hematite has been quoted on for Italy. Several small lots malleable were sold at $45.50 eastern Pennsylvania furnace. Last half business in gray forge iron is confined to carloads. As intimated last week, a large eastern Pennsylvania consumer has decided to postpone closing for third quarter basic. No basic was sold during the week and no live inquiries are current at present. Good business is being done in foundry iron. Apparently $43 eastern Pennsylvania furnace for No. 2 plain (1.75 to 2.25 silicon) and $44.25 for No. 2 X (2.25 to 2.75 silicon) now can be done only on second half and $44 and $45 respectively are the usual asking prices on first and second half. One interest booked 2000 tons for second half on a $45 furnace basis. Some central Pennsylvania foundry iron continues to be sold for second half at $42 furnace base. Virginia iron continues on a basis of $42 furnace for No. 2 plain but some spot high silicon has been sold on the basis of $42.25. First half iron is harder to get by reason of the extent to which production has been curtailed by coal shortage and weather. One result of the weather conditions has been the unusually large production of off-iron lately.

Last Half Iron Scarce

Chicago, March 9.—With the leading producer of pig iron in the Chicago district practically sold up on its last half production and many melters not yet covered to the extent of their requirements, it seems certain that much pig iron for last half must be bought from other centers. Following the heavy buying of the past few weeks, a comparatively quiet market is in effect now, although some selling is being done constantly. Basic users in the west have not yet bought and as they usually take heavy tonnages, a scramble for this iron is likely to follow. On spot iron $45, Chicago furnace, is asked for such small accommodation lots as are being sold. On southern iron for this delivery $42, Birmingham, is the going figure. Southern iron appears to be somewhat irregular with some interests quoting $40, Birmingham, for last half, while others are holding at $42. Producers are not pushing sales but are taking care of all inquiries, indications being that a campaign would develop heavy tonnages. A Wisconsin melter is in the market for 1000 tons of malleable and 2000 tons of foundry for last half. While not much activity is evident in Lake Superior charcoal iron, a Wisconsin user has just placed a contract for 2000 tons for last half delivery at a price understood to be about $52.50, furnace. This is somewhat under the published quotation and the considerations involved in the lower price are not known. Low phosphorus is steady at $51 for prompt supplies. Silvery iron is apparently scarcer than formerly, a Tennessee producer being forced to blow out for lack of fuel and several stacks in Ohio are not producing. A recent sale of 1000 tons for last half was made from a Tennessee stack at $55, for 8 per cent, for last half.

Market Shows Firmness

Cleveland, March 9.—Consumers of iron who have not yet covered on their future requirements are inclined to be more conservative in placing business at this time. One local furnace interest which has been out of the market for some weeks and has just started to book regular customers for last half has taken a round tonnage in Cleveland and vicinity at its price of $43 furnace for the base grade equivalent to $42 valley. Such sales in the week totaled 10,000 tons. Another Cleveland maker is holding at $43 furnace for 1.75 to 2.25 silicon and is taking on little tonnage constantly. A lake producer sold in the week 9000 tons of foundry including 2000 tons to an Indiana stove manufacturer and two 1000-ton lots to Ohio melters at $42 base. This interest also disposed of several hundred tons of malleable at $44.50 furnace. A valley maker on Monday sold 1000 tons of No. 2 foundry to a western Pennsylvania consumer for last half shipment at $42, furnace. There seems to be no question therefore that foundry iron continues firm at $42 valley basis. One southern Ohio maker who came into the market offering iron at $42 furnace for the base grade which

is somewhat below the figure recently asked by other makers in that territory, has withdrawn after having booked a considerable total of business.

All indications in this market point to $43 valley as continuing to be the going figure on basic. As reported last week a northern Ohio steelmaker bought 5000 tons of prompt iron at or slightly above this basis. This included it is understood several thousand tons from the same source at Pittsburgh from which some of the recent $41.50 iron recently emanated, and this latter transaction was subsequent to the lower priced sale. A valley maker it develops also sold 1500 tons to the same buyer for prompt shipment at $41.50 valley basis but it is understood to have no more metal for sale at that figure. The Canton, O., furnace which was banked last week has resumed. The stack of the Jackson Iron & Steel Co., Jackson O., will blow in next week.

Basic Price Better Defined

Pittsburgh, March 9.—Although the marketing of some recent resale basic pig iron makes for some irregularity in prices of that grade, the actual market is more clearly defined than was the case recently. Iron of this grade within the past week has sold from a valley furnace at $43 to an Ohio steel manufacturer, shipments to be made during the second quarter and the tonnage involved is between 5000 and 6000 tons. This price still is the minimum figure of the valley merchant interests, for on another inquiry emanating in Ohio and involving about 5000 tons, the buyer was obliged to go elsewhere to secure some tonnage at less than $43, furnace. This inquiry came from the American Rolling Mill Co., Middletown, O., and it is explained that the iron was bought at $42.50, valley furnace basis. Nothing actually is known as to the source of this iron, but the understanding is that southern basic was bought. Meanwhile more of the product of a Pittsburgh district steel company has been sold at $41.50, valley furnace basis. The company making this iron has not accepted for some time any important tonnages and the recent sales at $41.50 are of lots contracted for some weeks ago well under the present prices. As a further indication of the fact that the market is well established at $43 on standard valley basic, it might be stated that the iron which was sold at $41.50 is not strictly standard and it runs rather high in silicon. It is reported that a Cleveland steelmaker recently bought a round resale tonnage of basic at $41.50 valley furnace basis and brokers in this district recently had an offer from a New York export house of 3000 tons of basic on cars at Pittsburgh at a net price of $41 to the firm offering the tonnage. The tendency on the part of middlemen having tonnages of basic iron coming to them and which show a good profit at slightly under the present base is to take profit. Producers, however, still are bullish on the situation, pointing out that they are seriously behind in their obligations and any production over the remainder of this half year will be absorbed by present booking. As a general proposition the market has been extremely quiet during the past week. Small sales of bessemer have been made at $42 valley furnace for prompt delivery but only a few hundred tons are involved. Users of foundry iron are more inclined to press for shipments against old orders than to place new ones. While it is believed some second quarter iron might be placed by prompt paying buyers around $41 valley furnace, for 1.75 to 2.25 silicon, no business has been done at that figure and $42 is the usual minimum. A sale of 1000 tons for last half to a western Pennsylvania foundry was made within a day or two at $42 valley for that grade. The market also was a little indefinite on malleable at present, for while the last important sales of standard analysis iron were at $44, it is claimed that offers recently made at $42 have failed to result in sales. Offerings of this grade, however, are believed to be of iron running high in manganese. The Crucible Steel Co. in America is seeking 2500 tons of high silicon basic for its Harrison, N. J., works, for next three months.

Boston Deliveries Slowed Up

Boston, March 8.—Just as pig iron was commencing to move into New England to relieve the acute shortage at foundries, another storm complicated the transportation situation, and it will now be at least another week before adequate deliveries can be made. In the meantime, several foundries have been forced to close down. Pig iron in New England is able to command almost any price, and a basis of $60, furnace is not unusual in the trading. The general question of transportation difficulties is occupying the minds of both dealers and consumers and the result has been a lapse in interest in iron for future delivery. Prices of iron delivered in New England in the last half remain at $45, for the base grade at Buffalo furnaces, or $48.90, delivered in New England; $44 to $45 at furnaces in eastern Pennsylvania; $42 in Virginia and $42 in the Alabama district. One Virginia furnace is reported as having sold iron on an advanced basis but no such sale for New England delivery has been disclosed. Several furnaces are still offering prompt and first half iron in limited quantities, but are unable to deliver more than a small percentage of their orders for New England destination. A survey of the orders placed in New England for last half indicates that there is still a round tonnage yet to be sold. Several of the largest consumers have bought nothing or delivery beyond July 1, and many others have only partially covered. Southern furnaces have perhaps been more active in the prompt delivery market than any other interest because of the fact that they are able to make rail and water shipments in to Boston. No. 2 southern foundry iron (silicon 1.75 to 2.25) is being delivered on the docks at Boston by southern furnaces for $47.75, and takes the local freight rate to destination, plus a 40-cent handling charge. General sales during the past week totaled approximately 7000 tons.

Furnaces Accumulate Tonnage

New York, March 8.—That Scotland, which it recently was thought might be a seller of pig iron to the United States, will be a source of supply to this country, now appears to be a remote possibility. Latest information is to the effect that all of the Scotch makers are sold up, and this situation appears to be reflected in the fact that there now are inquiries for pig iron for Scotland in this district totaling 7000 tons.

Indications are accumulating which point toward an early lifting of railroad embargoes which still are in force. The Central Railroad of New by reason of the car shortage. It is learned that many thousands of tons of pig iron have accumulated at the furnaces, particularly in the Buffalo district, by reason of the difficulty of getting cars.

Demand for pig iron during the past week has been very quiet, and new inquiries involve comparatively small tonnages. Prices are unchanged, ranging from $43 to $44, eastern Pennsylvania furnace, for 1.25 to 1.75 silicon foundry and $44.25 to $45 for 2.25 to 2.75 silicon. One eastern Pennsylvania maker, of late, has been holding for $45, furnace, for 1.75 to 2.25 silicon, but the extent of the sales which have been made at this price is not known. Central Pennsylvania foundry continues to be held on the minimum basis of $42, furnace, for 1.75 to 2.25 silicon for last half, but no tonnage is being solicited. The last sales of Buffalo foundry which were noted in this district were on the basis of $45, Buffalo, for 1.75 to 2.25 silicon.

A large eastern Pennsylvania interest is in the market for a round tonnage of low phosphorus iron. A sale of a moderate tonnage of copper-free low phosphorus iron for last half is reported at $49, furnace. Some small lots of basic and bessemer have been sold for quick shipment at $42 to $42.50, eastern Pennsylvania furnace. A lot of 1500 tons of malleable for last half delivery in this district has been sold at the equivalent of $44, Buffalo.

Buys Basic at $43

Buffalo, March 9.—About 4000 tons of foundry iron was sold in this district during the past week. Two furnace interests say their sales amounted to 1000 tons each, and one furnace is said to have committed itself to between 1000 and 2000 tons for delivery over the last half. The price of $45 was the ruling one on No. 2 plain (1.75 to 2.25 silicon), $46.25 on No. 2X (2.25 to 2.75 silicon) and $48 on No. 1X (2.75 to 3.25 silicon). A Canadian consumer inquiring for basic in this district is said to have placed 7000 tons at $43, or $1 less than what has been regarded as the ruling price on this grade for some weeks. The furnace said to have taken this tonnage is now practically out of basic. One Buffalo furnace has been forced to bank for a week due to lack of good average. Inquiry is falling off, but foundries are insistent for iron. Some foundries have had to suspend operations temporarily for lack of metal.

Market Less Agitated

Cincinnati, March 8.—While there is a steady and consistent buying demand in the Cincinnati pig market there is slightly less urgency on the part of buyers, and the frenzied appeals which characterized the market activities of many consumers during

the greater part of last month has subsided. As a result the market presents a more stable attitude, with fundamental controlling conditions unchanged. Producers are busy and are extending their production to the limit of their facilities but there is little increase of surplus stocks anywhere.

During the past two weeks relatively free offering of spot iron has appeared in some quarters, but in most instances it has been of inferior grade; so much so in fact that it could not be applied against regular orders. These offerings have been readily salable. The quality of much of this iron was due to the fact that it was necessary for some of the furnaces to use poor coke to keep going. Three rolling mills have made inquiries for heavy tonnages of steelmaking iron for shipment in the last half. Prices nominally are unchanged although there have been some recent sales, both spot and future, at slightly shaded figures.

Postpone Buying at St. Louis

St. Louis, March 6.—A number of important interests which need pig iron are putting off buying, and in one notable instance borrowing has been resorted to in order to avoid entering the market. In other cases scrap is being used extensively to put off the day of buying. On the other hand plants with heavy orders booked, are covering against them freely in the raw material market. Producers, while more willing to sell than heretofore, especially into the last half, are not pressing sales. Prices are stronger, the range on No. 2 southern (1.75 to 2.25 silicon) being from $40 to $43. The major figure is obtainable for spot, of which there is a scarcity. There can be no doubt that virtually all interests in the district are well covered on all requirements for a long time, but this fact avails little now, when the car shortage is resulting in small deliveries on contracts. One southern producer who at the close of last month was offering iron at $40 has raised his price now to $42 for prompt shipment. Other producers have followed suit, and little if any $40 iron is now being offered. The National Stamping & Enameling Co., at Granite City, has started its eighth furnace and is seeking an additional 10,000 tons of basic. The Mississippi Valley Iron Co., leading producer of pig iron in the district, will blow in its stacks within the next month.

Southern Market Less Active

Birmingham, Ala., March 9.—While the pig iron market is less active than recently it is not dull. A few sales are being made, and prices range between $38 for No. 2 foundry 1.75 to 2.25 silicon quoted by the largest producer, to $43. Some 600 tons have been sold at the latter price for delivery during the third quarter. Several small lots were sold on a basis of $42 for No. 2 foundry. One producer offered 10,000 tons, for delivery during the last half, and sold some of it at $40. No. 3 furnace of the Tennessee Coal, Iron & Railroad Co., at Ensley, which made a great record by running for years without relining, has been blown out for repairs.

Coke Cars Still Lacking

Placements in Connellsville Region Amount to About 30 Per Cent. Instead of Allotted 50 Per Cent — $10 a Ton Paid for Spot

Pittsburgh, March 9.—Car supplies remain the dominant factor in the beehive oven coke market. While the Connellsville regions last week started off with a 50 per cent car allotment for coke, the quota starting with Tuesday and holding throughout the remainder of the week was only 30 per cent. The average car placements for the week, therefore, were not much abov 30 per cent of the ratings. The ratings were revised about a year ago, and so reduced that any given percentage would mean a considerable drop as compared with former rating practice. Yesterday, the regions had 60 per cent placements, but today, the allotment was down to 30 per cent and because of the recurrence of cold weather and its probable effect upon the movements of loaded cars, the outlook for the remainder of this week is poor. Beehive coke production could be increased fully 50 per cent over the recent average and still be insufficient for wants. Practically none of the merchant pig iron producers has any reserve to draw on and the general position of these interests is one of dependence upon the daily receipts. A large number of furnaces are being operated under checked blast, while cases are fairly common where stacks have been able to keep going only as a result of the ability of the owners to borrow supplies. Meanwhile, several of the steel companies, ordinarily self-contained through ownership of coal mines and either beehive or by-product coking ovens, are unable to get enough coal, and remain in the market for merchant beehive coke. The coal situation is even worse, for the coal car allotment for the Connellsvile district yesterday was only 40 per cent, while today no cars were placed for shipments. Only the passing of the winter will bring relief. Actual selling prices on spot tonnages are extremely indefinite. While occasional sales are being made to furnace interests at $7, ovens, that is absolutely the bottom price, while more common prices for spot tonnages are from $8 to $10. In some instances it is understood that even more is being paid. Connellsville production of coke for the week ended Feb. 28, is estimated by *The Connellsville Courier* to have been 248,035 tons, against 235,157 tons in the previous week.

No Relief at St. Louis

St. Louis, March 6.—There are no signs of an easing up in the coke stringency. Demands are becoming more urgent, and several of the smaller industries have had to borrow supplies. Many of the most important ovens which usually supply this center report they are well sold up, and will have nothing to offer for a long time. The south is not furnishing any coke to this district, and will not this season, the output of that region being fully engaged for home consumption, and customers in the west. Advices from the Southwest indicate almost famine conditions, and shipments of only a few cars are earnestly requested. The leading by-proudct interest here is producing at capacity. Smelters in the Missouri and Oklahoma districts are in serious need of fuel.

Active Buying at Boston

Boston, March 8.—Active buying of coke which followed the opening of the books of New England by-product producers for last half delivery continues. Sales have exceeded expectations of dealers, and were so heavy during the week that the Providence Gas Co. withdrew from the market. A large proportion of the last half business of New England foundries has been placed and those that are delaying purchasing are waiting to learn their requirements rather than in expectation of obtaining lower prices. Spot coke is in strong demand from points outside of New England but the available supply of the New England Coal & Coke Co. which is practically the only concern able to offer prompt delivery is rapidly decreasing.

Sell Prompt Coke at $12.55

New York, March 9.—The Providence Gas Co. withdrew from the market Saturday after selling considerable foundry coke for second half delivery at $13.95, delivered, New England. The New England Coal & Coke Co., continues selling at this price in New England for the second half, and is booking considerable second half business in this district at $11.55, ovens, and also considerable spot coke at $12.55, ovens. This maker sold 7500 tons for April delivery to an eastern Pennsylvania blast furnace at $12.55, ovens, the furnace being confronted with the alternative of paying this price or shutting down. Another furnace was reported negotiating for this coke. Offerings of spot beehive coke are reported larger, but only a few hundred tons of foundry are included.

Slight Improvement in Output

Cincinnati, March 8.—Most of the coke dealers in this district are making efforts to keep out of the market. Some improvement in production has been noted during the past few days, but the car shortage continues. Demand is far in excess of supply, chiefly because of lack of delivery. Foundries readily took all the coke shipped into this district last week.

Supply Still Below Needs

Birmingham, Ala., March 9.—Coke production in Alabama is still less than required. Official announcement is made that the plant of the Birmingham Coke & By-Products Co., at Boyles, will be producing coke March 15. The by-product coke oven plant of the Sheffield Steel & Iron Co., at North Birmingham, including 120 Semet-Solvay ovens, is nearing completion. The ovens will be in operation by April 15.

Bars Sold Through 1920

Leading Maker in West Completely Out of Market—Problem to Supply Railroads—Billet Prices Fixes Early Material

Chicago, March 9.—Although the situation in finished steel is tight in every department, soft steel bars appear to be sold out more completely and to a greater distance ahead than any other. The leading interest is unable to take any further bar business for any delivery in 1920. This condition exists in the face of the fact that its bar mills are being operated to the limit of their capacity, full supply of steel being furnished them, while plate and shape mills are being cut down in their allotments of ingots. Even under these circumstances no way is seen whereby further bar and small shape tonnage can be booked. The acuteness of the situation is evidenced by the fact that this interest cannot take carbuilding material when it includes bars, although willing to furnish its share of plates and larger shapes. Bar quotations are 2.62c to 2.87c, Chicago mill.

Bar iron continues to be quoted at 3.50c, minimum, and upward, sales as high as 4.50c, Chicago mill, having been made. Demand is somewhat quiet for the moment, with railroads buying practically nothing, but mills are booking far ahead.

A tremendous demand is being received for hard steel bars rerolled from rails, much more than can be entertained by makers. Two inquiries for 5000 tons and 10,000 tons for use in reinforced concrete construction have been current recently. Neither met with much reception in western mills. Delivery ranges from six weeks to six months, according to schedule. The quotation continues at 3.50c, Chicago mill, minimum.

New Sales Are Small

Philadelphia, March 9.—Very little activity in steel bars bars has been noted in this district the past week. Sales reported are small and scattered and prices range from 2.35c to 4.00c, Pittsburgh. It is reported some rerolling mills have sold small lots as high as 5.00c. Bar iron is quoted from 3.50c to 4.00c, Pittsburgh, depending on quality. Railroad spikes have been advanced from 4.00c to 4.20c, Pittsburgh. No change has been announced for smaller spikes.

Early Tonnages Still Scarce

Pittsburgh, March 9.—It is still difficult for buyers to obtain early tonnages of merchant steel bars unless they are prepared to pay prices based on the present market for rerolling billets. The latter are selling anywhere from $60 to $70 per ton, Pittsburgh or Youngstown, and with a conversion charge of at least $20 per ton few makers are willing to consider less than 4.00c, base, on early bar shipments. This price was the basis of a considerable tonnage recently closed by a maker of cold finished steel bars, and small tonnages continue to be reported at 4.50c, and even higher. One large company with a plant in western Pennsylvania and in the east is naming 4.00c, base, Pittsburgh, against all new inquiries. The full range on steel bars runs from 3.00c to 4.75c, the lower price being the base at which some of the independent companies will invoice second quarter shipments, booked some time ago and subject to a later naming of price. The mills have not succeeded materially in reducing their obligations, owing to the scarcity of steel and cars, and unfilled tonnages with most makers are sufficient to engage capacity well into the third quarter.

The demand for concrete reinforcing bars is steady, rather than active. New steel bars of this sort are selling at 4.00c to 4.25c, base, Pittsburgh, from independent mills, but the Carnegie Steel Co., although well sold up, has never withdrawn the old quotation of 2.35c, base, with the usual extra for twisting and deforming. These bars rolled from old rails have a range of from 3.50c to 4.00c mill.

Makers of iron bars are accepting less than one-third of the business offered them, aiming to care only for the wants of their regular customers. Prices are firm on a base of 4.00c for common bars.

Foreigners Seek Bar Iron

New York, March 8.—Demand for bar iron is coming out in substantial quantities. Domestic buying is fairly active, and foreign demand, principally from South America, is good in the aggregate. Eastern mills are offering deliveries from four to six weeks. Prices are still hovering around 4.00c, Pittsburgh, for delivery in the East.

Press For Tonnage

Cleveland, March 9.—Farming implement manufacturers are pressing the mills quite vigorously for bar tonnage. Some of them complain they have not had the opportunity to close for as much tonnage as they would have liked. Some large requests for reinforcing bars continue to appear. In one recent singly lot from the east which has come indirectly to the notice of sellers here, 20,000 tons were sought. The local buyer who recently inquired for 10,000 tons has not yet placed this business. Some makers of reinforcing bars now are quoting 4.00c mill but can offer only certain sizes.

No Let-up in Demand

Pittsburgh, March 9.—No let-up is observed in the demand for early tonnages of cold-finished steel bars and shafting, and buyers who must have supplies for delivery over the next month or two lately have had no end of trouble in trying to cover them at less than 5.00c, base Pittsburgh. It has been reported recently that some makers whose production runs a little in excess of orders are apportioning the extra tonnage among their regular customers on a base of around 4.00c. The actual market is quotable anywhere from 4.00c to 5.25c, the higher figure being for a special grade of shafting. Bessemer screw stock drawn from wire rods recently has been sold as high as 6.25c for early delivery.

Bolt Demand Passes Bounds

Chicago, March 9.—Inquiry for bolts and nuts is tremendous and coming from sources which many makers had not known of previously. This is taken as an indication that all manufacturers of this material are loaded.

Sold to a Standstill

Pittsburgh, March 9.—Makers of nuts, bolts and rivets in this district are inclined to view new demands with indifference, as present orders are sufficient to keep them busy well into the third quarter.

Prices Still Rising

Pittsburgh, March 9.—Still higher prices have been reached by independent makers of hoops and bands, the minimum price of which as far as these companies are concerned, now being 5.00c, base, Pittsburgh, while sales of prompt tonnages are taking place as high as 5.50c, base.

Little Business

In Ferromanganese Placed During Week—Prompt Supplies Strong

New York, March 8.—Domestic ferromanganese still may be had for second half delivery at $160, delivered, but it is the impression in the trade that after certain tonnages now under negotiation are covered, this price will be withdrawn and succeeded by a higher one. As recently stated, $175, delivered, is being asked by one domestic producer for second half, but this interest has sold only one carload at this figure, as far as known.

No business in ferromanganese for last half was reported during the past week. One importer of English metal believes that he still would be able to book a substantial tonnage at $155, c.i.f. tidewater. There is some doubt, however, as to whether this figure really could be done. Another importer has a price of $165, tidewater, for shipment beginning in August. Small tonnages of English ferromanganese have been sold during the past week at $170, tidewater, for second quarter. Some spot ferromanganese, aggregating more than 100 tons, has been sold at $200, tidewater.

Several small lots of spiegeleisen have been sold during the past week for delivery at various times prior to July 1. For 20 per cent metal, $60, furnace, was obtained, while somewhat less was done on spiegeleisen containing less manganese than 20 per cent.

Little activity has been reported among the specialties in the ferroalloys the past week.

Ask $170 for Third Quarter

Philadelphia, March 9.—Although ferromanganese makers have moderate price views, and are willing to book orders for the last half at $160, delivered, they will not accept third quarter business alone at this figure. One

maker is asking $170 for the third quarter. This policy is due to the fact that it has covered for ore for the entire last half. Several lots for the last half have been sold at $160, the total amounting to 1000 to 2000 tons. One maker is 75 per cent sold up for the last half. Spot ferromanganese is scarce and 72 to 76 per cent material has been sold in carloads at $2.25.

Manganese ore is being sold at lower prices. Several lots of Indiana ore for shipment in two to three months brought 70 to 75 cents, tidewater. A large tonnage of ore from the Russian caucasus for delivery over the rest of the year was sold at 65 cents for the first half tonnage, and at 60 cents for the other half to be delivered over last four or five months. The same ore a few weeks ago was quoted at 70 to 75 cents.

Indian Ore Sold

Philadelphia, March 9.—Considerable tonnage of Indian manganese ore has been sold, for shipment in two or three months, at 70 to 75 cents per unit, c.i.f. tidewater.

Not Much Going On

Pittsburgh, March 9.—Activities in the ferroalloys market here are on a much restricted scale. In the case of ferromanganese this is accounted for entirely by lack of supplies for early delivery while consumers appear to be well fortified against their immediate requirements on ferrosilicon and the other ferroalloys. It is doubtful if any trouble at all would be experienced in making sales of 76 to 80 per cent ferromanganese for prompt delivery at $200, delivered. Buyers in need of early material are not balking at paying that price where they can locate supplies. On last half metal the market is quotable at around $160, delivered, with small orders.

While makers of 50 per cent ferrosilicon generally are quoting $85 furnace, freight allowed, and some a materially higher figure, there appears to be no basis in sales for a price of more than $80 and a Massillon, O., user claims to have recently purchased below $80 furnace, freight allowed.

Demand is Better

Pittsburgh, March 9.—Several of the steel companies which, because of the existence of fairly sizable stocks did not enter contracts for fluor spar last fall, now appear to have exhausted their supplies and are in the market for early tonnages. This demand appears to have strengthened prices and producers now are quoting washed calcium fluor spar at $25 f.o.b. mines for 85 per cent and $22.50 for 80 per cent spar.

Prompt Ferro at $230

Chicago, March 9.—With the present contract of the Miami Metals Co. covering use of a blast furnace stack at South Chicago expiring April 1, production of ferromanganese will be continued by the owners of the stack for an indefinite period. Sales have been made against this production at $200 per ton for 70 per cent alloy, with $3 per ton added for each point of manganese, bringing 80 per cent to $230 for prompt material.

More Selling In Plates

Improvement of Production In East Swells Offerings—Selling Done For Last Half—Book Liberally At 4.00c

Philadelphia, March 9.—The coal situation improved somewhat so that steel mill operations in the East are better and one large plate mill which was hard hit now is producing at 65 to 70 per cent. Several mills have been taking contracts for second quarter at 4.00c Pittsburgh and report an active demand. As the result of the increased output, fair tonnages have been booked at 4.00c Pittsburgh for quick shipment. Anything under this figure now is considered low. On the whole while the market is strong, the plate mills by reason of the increased production generally, are willing to book more tonnage than was the case recently. The railroad demand for plates is apparently satisfied. These buyers have enough tonnage for their nearby requirements and it appears to be part of the policy of most roads not to buy too far ahead at present prices. However, there are big demands for car plates in the market. The New York Central car inquiry alone calls for 100,000 tons of plates. The best deliveries on plates now available appear to be three months on heavy plates while light plates are much more extended. There is some inquiry for ship plates but this is much smaller than recently.

Large Demands in Sight

New York, March 9.—The Standard Oil Co. has withdrawn its inquiry for six tankers, but there are large new shipbuilding demands in sight here, which, with requirements for cars and locomotives, make up a big prospective order for plates. One company which has been offering plates for the second quarter at 4.00c has sold a large part of its second quarter output. It is reported that some plate tonnages for the second quarter is being offered at 3.75c, but this cannot be confirmed.

Hard to Place Orders

Pittsburgh, March 9.—Plate users are finding considerable difficulty in interesting any of the makers in this district in tonnages calling for delivery over the next 60 or 90 days, due to the fact that all of the latter are heavily committed and are making provisions for looking out for railroad requirements as they develop. Both the Carnegie Steel Co. and the independent manufacturers believe that in helping out the railroad equipment companies they are helping themselves and it is stated that presentation of an order from domestic railroads for cars is all that is necessary to secure a place on the books of the platemakers. Such business is being accepted by the Carnegie Steel Co. at the old base of 2.65c, but the more general quotation of the independent makers is around 3.25c. The full range on plates is from 2.65c to 4.50c, but the market for early tonnages is quotable from 3.50c to 4.00c. No big railroad orders yet have been placed with makers in this district although orders for repair parts are on a heavy scale. Makers of boilers and tanks have heavy order books but some of them apparently are getting pretty good deliveries against orders.

Selling for Last Half

Chicago, March 9.—Books of the leading interest appear to be open for last half tonnage, as during the past few days lots have been taken for second quarter specification, for such delivery as can be made, no special time being promised. This means third and fourth quarter delivery under present conditions. Business is being taken only from regular customers, and tonnages are limited to quantities comparing with previous purchases. Prices being named on this business are same as those prevailing in the selling by the leading interest during the past year. The present range of quotations continues at 2.92c to 3.17c, Chicago mill.

Various Raises

Quoted By Makers of Cast Iron Pipe—Mill Demand Intense

Chicago, March 9.—With nominal quotations unchanged, numerous lots of small pipe are being quoted by some makers at $2 to $4 higher, depending on the condition of the maker's order books. This condition is not believed to foreshadow a further advance and makers think present prices probably represent close to the high market. The National Cast Iron Pipe Co. is low bidder on 750 tons at Milwaukee. Bids will be opened March 9 at Saginaw, Mich., on 1500 tons, and at Detroit on 2900 tons. Bids will be opened at Stratford, Wis., March 10 on 180 tons.

Some Makers Advance

New York, March 8.—The market on cast iron pipe in the East continues strong and some of the shops have advanced their prices on the smaller sizes $2 a ton. This advance is not general, although more widespread action is likely. For the present, private demand continues to hold the center of attention.

Car Shortage is Felt

Pittsburgh, March 9.—While operations of the pipe mills in this district are practically full, the fuel scarcity is affecting activities of plants in the valley district and plants in both districts are feeling the effect of the car shortage, both on in and outgoing freight. Use of any kind of rolling stock that is available has prevented heavy piling up of finished tubular goods with makers here, but at that, supplies waiting cars to be moved are larger than is desired at this time, with buyers pressing for shipments against orders. No letup is noted in the demands for either oil well or merchant pipe and makers are flooded with importunities for tonnages of boiler tubes for stationary boilers.

Scrap Market Is Firmer

Decline in Prices at Chicago Checked—Little Activity Is in Evidence Except at Buffalo—Some Districts Show Weakness

FOR COMPLETE SCRAP PRICES SEE PAGE 814

Chicago, March 9.—Downward tendencies of the iron and steel scrap market at Chicago seem to have been checked, at least temporarily and some adjustments have been made by slight increases in quotations on a few items. The market seems on a firm basis, and while consumers are not buying, brokers are taking more material to apply on former orders. This has the effect of giving the market a generally better feeling. Cast scrap is in much demand and its price is held firmly. Rerolling rails are not coming out except in small tonnages, and while mills are buying lightly this demand is sufficient to hold quotations practically level. Difficulty in obtaining cars for shipment and labor to handle scrap continues to handicap dealers in collecting and delivering this commodity. Railroad offerings continue light, the Wabash offering 1700 tons and the Southern 2200 tons.

Few Sales in Quiet Market

Philadelphia, March 9.—Worth Bros. and the Phoenix Iron Works each bought 500 tons of steel scrap at $26, delivered. Alan Wood Iron & Steel Co., is reported to have bought but this is not confirmed. The Standard Steel Works bought 12,000 tons of low phosphorus scrap. Otherwise the market is quiet but its tone is strong and dealers expect heavy buying after the coal situation permits mills to get back to normal operations. Scarcity of borings has resulted in sales at $25, delivered.

Boston Prices Soften

Boston, March 8.—Customers of New England scrap dealers in Pennsylvania are hampered in their operations due to lack of coke, and the falling off in demand has caused a softening in several grades. Machine shop turnings have dropped to $16.50, delivered to dealers' yards, and borings have also declined about $1. Prices of other grades are unchanged. The tieup of the railroads has helped to sustain prices. All cast grades are in active demand for immediate shipments, for foundres are running low in their supplies of pig iron and scrap. Four carloads of No. 1 machinery were sold to an eastern Massachusetts consumer in the week at $46, delivered. It is thought that as soon as the transportation situation clears up, the sudden release of large shipments of scrap will cause a further drop in prices.

Metropolitan Market Weak

New York, March 8.—While prices are unchanged, weakness continues in evidence in the local scrap market. Supplies appear plentiful in most all instances, and demand remains slow. Only in borings and turnings does there seem to be a free movement. An eastern Pennsylvania consumer has been covering on substantial quantities of these grades. Shipments on back orders are improving, but still are retarded, and in New England ingoing shipments are again held up by embargoes. Outgoing shipments, however, are being made.

Trade Still Marking Time

Pittsburgh, March 9.—Trading in scrap iron and steel, except between dealers, has come almost to a halt in this market. No appreciable improvement yet has developed in the transportation situation as far as the steel plants are concerned and with most of them embargoed, shipping instructions against contracts largely are holdup requests. Dealers who have any material on track are unable to dispose of it except to some other dealers, who will not pay within $1.50 to $2 per ton of the price at which the steel companies recently have paid. Comparatively little "distress" material is becoming available, but in the lack of sales to the mills, such lots, involving usually a carload or two, are the basis of present quotations. It is doubtful if steelmakers would be quoted less than $29, delivered, against an inquiry for heavy melting steel, but that grade has been sold between dealers as low as $27.50. Nominal values of other open-hearth grades take the usual price differentials from that grade. Not much activity is observed in foundry and special purpose scrap.

Renewed Interest in Some Grades

Buffalo, March 9.—With the return of the railroads to private ownership, scrap dealers see a renewal of activity in the market. Makers of steel castings are becoming interested in the low phosphorus market. Several good-sized inquiries are before the market, and one lot of 3000 tons of this grade was sold in this district during the week at $32.50. Local mills are not buying much heavy melting steel. A sale of 1000 tons at $26.50 was the only activity noted in this grade.

Dealers More Conservative

Cleveland, March 9.—Scrap iron and steel dealers appear bent on cleaning up contracts on their books and apparently are not anxious to sell. One large melter of heavy melting steel has been quoted $27 and $27.50, which is $1 and $1.50 a ton above the prevailing quotation. While a great deal of scrap still remains in dealers' yards, practically all of it has been sold, and dealers are becoming more conservative. Whether a melter could pick up a sizable tonnage now in this district is doubted by many dealers, at least they would want several dollars above the present quotations. Dealers are firmer in their price ideas. A dealer has picked up a 500-ton lot of steel in the valley for $27.25, while in carloads steel can be had there for $27. Melters would be asked at least $28 in the valley, dealers say. Valley melters are expected in the market shortly, with higher prices resulting. Some steel is now being shipped to the McKinney Steel Co. plant, which has been embargoed for weeks. Every indication in the Cleveland market now points to much strength. Prices, with the exception of large forge flashings, are unchanged.

Cincinnati Market Active

Cincinnati, March 8.—The scrap market has developed considerable activity and strength. Dealers' stocks and those held in the yards of mills have been reduced by the recent buying and prices have shown a tendency to advance. Rolling mill scrap has been heavily bought, and there has been a big demand for foundry grades, the shortage of spot pig iron tending to increase the consumption of such scrap. Little buying for the future is noted. Country dealers are unloading stocks.

Activity Confined to Dealers

St. Louis, March 6.—Activity in the scrap iron and steel market is confined largely to dealers. Local mills and foundries are not buying material, but considerable scrap has been bought here for shipment to Chicago and points further east. Some changes have been made in dealers' lists, chiefly downward, but they were in the nature of adjustments and can hardly be construed as an indication of weakness. Malleable grades are more in demand, and cast iron borings are strong. The only railroad offerings before the market in the week was a list of 1100 tons by the Missouri, Kansas & Texas. The Mobile & Ohio railroad, effective today, has moved its purchasing department from Mobile to St. Louis, and will hereafter market most of its scrap at this point. Relaying rails are in strong demand and higher, the price having been marked up from $49 to $50 to $52 to $55.

Market Shows Softness

Birmingham, Ala., March 9.—Quotations on scrap iron and steel in the south are weakening. Consumers of heavy melting steel are still buying slowly, and there is an embargo on the largest consumer in the district.

Piling Tin Plate

For Want of Cars to Make Shipments —Operations Better Than 80 Per Cent

Pittsburgh, March 9.—By far the greater portion of the current production of the tin plate mills in this district is being piled for want of sufficient cars to move it. The limit of storage space has not yet been reached, and several of the independent mills still are running full, while the industry as a whole is averaging more than 80 per cent operations. This condition cannot be maintained much longer, however, unless more cars soon are available. Steel supplies are moderate, but as a rule sufficient to keep mills going at the present rate of operations. No letup is noted in the demands for early tonnages, because shipments against old orders are delayed by the shortage of cars. Stock items are carefully scanned by makers of containers in the hope of finding something that will tide them over the present emergency. Such plate is selling from independent makers' plants at $8 to $8.50 per

box. This constitutes the bulk of spot offerings, as production of standard plate over the next six months at least is fully pledged. Some doubt exists that the independents will open their books for third quarter business, as it appears doubtful they will have any tonnage for sale, or that if they do, it will be so limited that they will apportion it among their regular customers. A similar course by the American Sheet & Tin Plate Co. would not be surprising in view of the fact that it, too, has unfilled orders equal to about six months' production. It is doubtful if a price of less than $10 per base box, Pittsburgh, today would be considered on export business.

Ore Shipments

To Furnaces Delayed—Southern Ohio Interests in Distress

Cleveland, March 9.—A shortage of men and cars and the frozen condition of the iron ore on the docks at lower lake ports are combining to prevent shipments to furnaces, and some of those with inadequate stockpiles are reported to be more in distress from this cause than to lack of coal or coke. Two furnaces in southern Ohio were in danger of being forced to shut down unless ore could be shipped to them, and after repeated efforts a small supply, sufficient to keep them going for a short time, was obtained. Other furnace interests which failed to get in sufficient ore last season also are reported in need, but it is almost impossible to get freight handlers to load the few cars available.

The ore on lower lake docks March 1 amounted to 9,015,813 tons, 1,290,727 tons more than on docks March 1, 1919. Shipments from docks to furnaces last month totaled 645,785 as compared with 910,948 in February, 1919. The movement for the season was 27,020,746 tons, while last year up to March 1 it was 38,583,964.

Lake freight rates on iron ore are expected to be announced within a few days as it is understood that the leading operators have their plans prepared. Delay in naming the rates is said to have caused some delay in the closing of contracts for ore. While a general advance of about 20 per cent is anticipated a shortage of tonnage may cause some vessel operators to insist on even higher rates.

One of the leading iron ore mine operators estimates that 80 per cent of the prospective output in 1920 has been sold. Furnaces generally have not purchased to the full extent of their requirements, but little new business was taken during the past week.

Eastern Output Already Sold

New York, March 9.—Most of eastern iron ore output for 1920 has been sold. The following are the Port Henry base prices: Old Bed furnace ore, $5.80 per long ton; Old Bed concentrates, 63 per cent, $6.75; Harmony cobbed ore, 63 per cent, $6.70; New Bed low phosphorus, 65 per cent, $9.50; lump ore for fix, $7.00. Considerable New York state handpicked magnetic ore, 62 per cent, suitable for foundry or basic iron, has been sold around 14 cents per unit, delivered, eastern Pennsylvania furnace.

Sheet Loss 500,000 Tons

Strike, Steel and Car Shortages Have Set Mills Back 73 Working Days — Deliveries Further Behind Than in Many Years

Pittsburgh, March 9.—Recent casting up of the loss of sheet production as a result of the steel plant and coal miners' strikes and the shortage of fuel in the past several weeks, shows a total of approximately 500,000 tons. Applied to a normal annual production of all mills of the country of about 2,500,000 tons, this is a loss of 20 per cent; applied to the number of working days in the year, it means that the production of 73 full working days has been lost. Adding this to the hindrances to production resulting from the shortage of steel and of cars, and it is not hard to understand why something akin to a famine of material now exists. Unfilled orders have been reduced little if at all in the past few weeks and it is doubtful if the mills in general have been so far behind in their deliveries in several years as they are at present. Since secondary manufacturing plants have lost little or no time during the period that the sheetmakers lost practically two and one-half months' production, it is apparent that these plants must expect to run closely for a time if the present shortage is to be materially relieved. Few makers will be able to deliver black sheets against March contracts before April, which March obligations of the mills on galvanized sheets are likely to be even further deferred, for the galvanizing departments of the various mills of the country still are feeling the shortage of labor and today are operating less than 60 per cent of capacity. Even more extended will be the deliveries against orders for electrical and highly finished sheets. The bulk of current production is being piled at the mills because of the scarcity of cars.

Sheet bars still are scarce, but seemingly more so with the American Sheet & Tin Plate Co. than with the independent makers, for while the latter have more than 80 per cent of their capacity in operation, the former at present is running only slightly in excess of 70 per cent. This company still is taking sheet bars for conversion into sheets wanted for quick shipment, but is doing so only for regular customers. Some of the independent companies are declining conversion business on the ground that it is creating ficticiously high prices for sheet bars and consequently for the finished sheets. Sheet bars are selling at considerably higher prices on conversion deals than the mills would pay for them on their own account.

Demands for early tonnages of all finishes of sheets still are numerous and insistent, but actual bookings are small by comparison, for the reason that makers more especially the independents, do not want to become any more heavily committed than they are at the average prices of their present obligations.

Railroad requirements of black and galvanized sheets for car roofings are expected to bulk large and to more than counterbalance any loss of export business which the exchange situation may bring about. Of the 700,000 box cars now on the rails, it is figured that at least 100,000 will have to be repaired and new roofs would take about 600 pounds of steel for each car, or fully 30,000 tons for repairs alone.

Mills Pile Up Tonnage

Youngstown, O., March 9.—Sheets continue scarce in this district with practically no tonnages to be had for prompt shipment. Mills are piling up material on account of the inability of railroads to supply them with box cars. In some cases shipments are going forward in open cars, the sheets being protected by tar paper. Foreign buyers are coming into the market more strongly but are receiving little encouragement from makers here. Those in a position to know state that 8.00c for one pass, cold-rolled black is not a long way off. They base their opinion on the fact that sheet bars are selling at $90 with little tonnage available at this figure. One mill in this district already has advanced its price of black to 9.00c mill and is confining its commitments only to four weeks ahead.

A factor, which has a decided influence on the sheet bar situation, is the number of new sheet mills placed in operation within the past 10 months. These additional units are absorbing a considerable quantity of sheet bars and the semifinished capacity created within the same period has not kept pace with the number of new sheet mills. This condition has every appearance of becoming more critical due to the large number of sheet mills now under construction and due to be placed in operation this year.

A large demand for highly finished sheets exists in this district. Mills specializing on this grade in some cases have not yet made delivery of orders placed last December for February delivery. Ordinary grades of sheets according to dealers are not as free as they were last week. Those that are available for this or next month's delivery are commanding higher figures in some cases sales of one-pass black having been made at 10.00c Pittsburgh.

Blue Annealed at 5.00c in East

Philadelphia, March 9.—Blue annealed sheets in this district are quoted at 4.85c to 5.00c. Pittsburgh, for No. 10, the higher price applying on sheets for early delivery. The leading eastern maker is not soliciting business, and is practically out of the market, although still taking some third quarter tonnage, at the request of regular customers, at 4.80c.

The Braddock Mfg. Co., Braddock, Pa., has sold its Braddock works to the Wilson-Snyder Mfg. Co., Pittsburgh, manufacturer of pumps and equipment.

Good Tonnage in Awards

February Record to Show Up Well—Current Lettings Maintained Though Some Important Work Is Being Deferred

Pittsburgh, March 9.—Indications are that the figures of structural awards for last month will make as good a showing as those for January when the tonnages awarded were equal to about 75 per cent of shop capacity. Actual figures for the month will be presented at the monthly meeting of the Bridge Builders and Structural society to be held in New York Friday. It is understood, however, that the lettings in the last week in February were the largest of any week since the signing of the armistice and brought the total for the month well up to that of January. The McClintic-Marshall Co. recently was awarded 2000 tons for the new buildings of the Pittsburgh Plate Glass Co., Pittsburgh, at Kokomo, Ind. Other recent awards include 1000 tons to the same company for the bins for the Robesonia Furnace Co., Robesonia, Pa., and 1100 tons to the Jones & Laughlin Steel Co. for the new mill building of the Pittsburgh Steel Products Co., Allenport, Pa. The American Bridge Co. recently was awarded contracts for 40 steel hopper barges by La Belle Iron Works, Steubenville, O., about 5000 tons. This company has mines at Harmarville, Pa., on the Allegheny river and will use the new barges for the shipment of the coal from the mines to its plant at Steubenville. The American Bridge Co. has delivered 15 of 25 steel barges for the railroad administration for use on the Mississippi river.

Fabricating interests report considerable difficulty in securing early tonnages of either plates or beams except at high prices. The Carnegie Steel Co., although holding to the old base of 2.45c for structural beams, is taking practically no business at present while prices of independent companies range anywhere from 3.10c to 4.00c.

Bridge Work Resumed

Boston, March 8.—Railroad bridge construction work, long held up, is expected to be resumed in the near future. The Boston & Maine and the Boston & Albany are asking for bids on bridge work, requiring several thousand tons of steel, which will be let during the present month. The transportation tieup together with the meager offerings from rolling mills have combined to hold up much structural work in New England.

Good Awards in New York

New York, March 9.—Contracts for about 15,000 tons of structural steel were let in this district during the past week. These included one for 5300 tons for the Liggett building at Forty-second street and Madison avenue, and 4000 tons for the Munson Line building, Beaver street. Other contracts included 1300 tons for the Lycoming Foundry, Williamsport, N. Y., and 1000 tons for various jobs for the Lackawanna railway. Another sizable contract was that awarded by the Lackawanna road for 1800 tons for a coal breaker at Scranton, Pa., the business going to an independent. The Hay Foundry & Iron Works took 200 tons for a brewery in South America. Among the larger inquiries is one for 1400 tons for the City club. The Boston & Maine railroad closes bids today on 300 tons of miscellaneous bridge work, and the Boston & Albany is to close bids shortly for 400 tons for two bridges. Mill prices generally are unchanged, although business at 4.50c, Pittsburgh, has been done by at least one mill.

New Demands Light

Philadelphia, March 9.—New shape demand during the past week has lagged somewhat. Companies making both products say demand for plates is far ahead of that for shapes. The reason seems to be unwillingness of builders to place contracts at present prices. Prices on the business taken by eastern mills in the past week ranged from the equivalent of 3.90c to 4.15c, Pittsburgh. A Pittsburgh maker which did some second quarter contracting at 3.10c, Pittsburgh, has withdrawn. The leading interest continues to take care of customers to the best of its ability at 2.45c. New demand for ship steel is much less active.

Hold Up Large Jobs

Cleveland, March 9.—More evidence of a general policy to delay building operations continues to come to light, it being reported that several large bank projects on which bids were taken recently have been postponed indefinitely. In one or two instances excavations have been made and foundations laid for buildings for which the structural steel could not be obtained at a satisfactory price, one of the largest publishing houses in the city having thus held up work for several months. While sheer inability to obtain steel has been the chief cause of such suspensions, the price factor also has prevailed. Regardless of the latter element, however, one interest believed to be connected with the automobile industry decided to buy 1500 tons of shapes from stock, for a new building, having been given protection on that basis. It preferred to pay the extra price rather than wait until delivery could be made from mill. The leading independent mill interest is preparing to resume operations of its standard mill within a few weeks and is now holding out some hope of comparatively early deliveries on some orders held in abeyance for a number of weeks.

Western Building Improves

Chicago, March 9.—Increasingly large numbers of building projects are being put through and during the past few days nine contracts were let in the west, ranging from 100 to 800 tons. The largest contract involves 805 tons for a building at Kenosha, Wis., for the Nash Motors Co. Possibility that the height limit of buildings in the downtown district of Chicago will be increased from 16 to 20 stories has given rise to expectation that building of steel-frame structures will be renewed, as several projects have been held back because of the restriction. An income from the taller building can be obtained where the shorter building would represent a loss. Numerous inquiries are pending which represent a large total of structural material. Nominal quotations on plain material are 2.72c to 2.97c, Chicago.

CONTRACTS AWARDED

Liggett building, New York, 5300 tons; awarded to McClintic-Marshall Co.

Munson Line building, New York, 4000 tons; awarded to American Bridge Co.

Building for Lycoming Foundry, Williamsport, N. Y., 1300 tons; awarded to American Bridge Co.

Lackawanna railway, various jobs in New York, 1000 tons; American Bridge Co.

Coal breaker for Delaware, Lackawanna, Western railway, Scranton, Pa., 1800 tons; awarded to independent.

Building for International Sporting club, New York, 1200 tons; sublet by Post-McCord Co., to American Bridge Co.

Brewery in South America, 200 tons; awarded to Hay Foundry & Iron Works.

Addition to the plant of the Massillon Rolling Mill Co., Massillon, O., 1200 to 1500 tons to the Belmont Iron Works.

Forty steel hopper barges for La Belle Iron Works, Steubenville, O., 5000 tons to the American Bridge Co.

Building for the Nash Motors Co., Kenosha, Wis., 805 tons, to American Bridge Co.

Buildings for beet sugar factory for Pingree-Idaho Sugar Co., Preston, Idaho, 393 tons, to Kansas City Structural Steel Co.

Addition to Sherman Hotel, Chicago, 382 tons, to American Bridge Co.

Manufacturing plant for Monighan Machine Co., Chicago, 284 tons, to American Bridge Co.

Cantilever riveted span, Metaline Falls, Wash., for Pen de' Oreille county, Wash., 225 tons, to Milwaukee Bridge Co.

Addition to foundry for St. Louis Malleable Casting Co., St. Louis, 161 tons, to Federal Bridge Co.

Theater building for Industrial Investment Co., Minneapolis, 159 tons, to Minneapolis Steel & Machinery Co.

First units fo new manufacturing group for H. W. Johns-Manville Co. at Waukegan, Ill., 2250 tons to American Bridge Co.

New buildings for Pittsburgh Plate Glass Co. at Kokomo, Ind., 2000 tons to the McClintic-Marshall Co.

Ore bins for Robesonia Iron Co., Robesonia, Pa., 1000 tons to the McClintic-Marshall Co.

Mill building for Pittsburgh Steel Products Co., Allenport, Pa., 1100 tons to the Jones & Laughlin Steel Co.

Hibernian National bank, New Orleans, 4000 tons; awarded to Virginia Bridge & Iron Co.

Sugar mill for West Indies Sugar Finance Corp., Cuba, 1500 tons; awarded to Belmont Iron Works.

Sugar mill extension, Central Progress, Cuba, 200 tons; awarded to Belmont Iron Works.

Charging floor and crane runways for American Locomotive Co., Chester, Pa., 300 tons; awarded to Belmont Iron Works.

CONTRACTS PENDING

Building for City club, New York, 1400 tons; bids being taken.

Bridge work for Boston & Albany railroad, 400 tons; bids being taken.

Bridge work for Boston & Maine railroad, 300 tons; bids in.

Grauman office and theater building, Los Angeles, 1200 tons, bids asked.

Ponchartrain hotel, New Orleans, 2115 tons, bids asked.

Bascule bridge at Main street, Kenosha, Wis., 728 tons, bids asked.

Warehouse for Steel Sales Corp., at Chicago, 1000 tons, bids asked.

Federal Reserve bank, Kansas City, 4500 tons, bids asked.

Four turntables for Chicago, Burlington & Quincy railroad, two 90-foot span and two of 100-foot span, bids asked.

Warehouse Stocks

Show Steady Price Advance During the Week—Market Is Unsettled

New York, March 9.—The local warehouse market is still highly unsettled, prices covering a wide range, and for the present the tendency continues upward. One large seller advanced quotations on sheets during

the past week 25 cents per 100 pounds and in some quarters various lots of materials are being reported as sold at astonishingly high figures, there still being many eager buyers. At the same time, however, there appears to be a tendency among the larger buyers toward greater conservatism.

Demand Causes Increase

Boston, March 9.—Increased demand, accelerated by delayed shipments was marked by an advance in price on practically all warehouse stocks in this district the past week. Steel bars are now quoted at 4.75c, as are iron bars and structural shapes; plates are 5.30c; blue annealed sheets, 6.30c; bands, 6.25c; hoops, 7.25c, and cold rolled shafting, 6.25c.

Philadelphia Prices Up

Philadelphia, March 9.—An increase was noted this week on some lines of warehouse material. Steel bars are now quoted at 4.50c; iron bars, at 4.50c; shapes, 4.50c; plates, ¼ inch and heavier, 5.50c, while plates, 3/16 inch and under, 6.00c; blue annealed sheets, 6.50c; black sheets, 7.50c and galvanized sheets, 10.00c.

Chicago Stores Advance Sheets

Chicago, March 9.—Independent steel warehouses in Chicago have advanced No. 10 gage blue annealed sheets $5 per ton to 5.77c, Chicago, and No. 28 gage black and galvanized have been advanced $10 per ton to 7.00c and 8.00c, Chicago, respectively. Stores of the leading interest are holding to former quotations and are being deluged with inquiry.

Cars Are Closed Slowly

Scarcity of Early Steel Is Blocking Equipment Business—Many Inquiries Active—Illinois Central Want 40,000 Tons of Rails

Chicago, March 9.—With about 30,000 cars on inquiry in this district and railroads anxious to obtain additional equipment, with an equal anxiety on the part of steel mills to assist in every possible way to add to the facilities of railroads, a condition has arisen which gives little promise of better things. With the best possible efforts it is not believed that steel for new cars can be delivered to builders earlier than August or September, and the leading interest is unable to take on any bars or small shapes under 3 inches for any delivery during the present year, the production in these lines for the entire year at full capacity now being fully covered. No further contracts for new cars have been closed nor has any steel been covered for further repair work. All inquiries recently presented are alive and price protection is being sought under them. A confidential inquiry for 1000 refrigerator cars has just been made known. The Santa Fe railroad desires 500 gondolas and the Northern Pacific railroad 1000 ballast cars. Further inquiry for cars is expected to come out shortly but inability of makers to obtain steel may have a discouraging effect.

Rail inquiry continues to come in, although the rail mill is still out for the remainder of the year. The aggregate of this business is 40,000 to 50,000 tons in small lots, mostly of 5000 tons or less. Although no selling of standard steel rails is being done some track fastenings are being booked where they are necessary to complete replacement programs with rails already contracted for. Some inquiry has been put forth for 1921 rail requirements including 40,000 tons for the Illinois Central which is willing to have the price fixed at delivery. Demand for light rails is active and some selling is being done for first half, but books have not yet been opened for second half. Demand for light rails for export is heavy, but the western mill is not taking anything but domestic business. Although some makers are asking 3.00c to 3.50c, mill, the Chicago quotation is 2.45c, mill, as has been the case for the past year.

The Union Pacific railroad has placed orders for 45 eight-wheel caboose cars, the latter to be built by the Pacific Car & Foundry Co. This is in addition to 4000 refrigerator cars recently bought by this road for the Pacific Fruit Express, a subsidiary.

Car Inquiries Grow

New York, March 9.—The Chesapeake & Ohio is inquiring for 1000 gondola bodies, the Grand Trunk for 3000 cars, the Virginian railway 1000 gondolas, the Chicago, Rock Island & Pacific for 2000 box, 500 gondolas, 500 refrigerators, 250 and 60 passenger cars, the Milwaukee, Kansas & Topeka for 25 passengers. The American Locomotive Co. has booked 67 locomotives including 25 for the Santa Fe, 42 for the Canadian National railways, three for the Oregon Lumber Co., two switching engines for the Akron, Canton & Youngstown, and several scattering.

One unusual inquiry now before the trade involves 1000 cars, having capacity for 120 tons each.

A movement now is under way to change the method of figuring the capacity of cars. By the suggested method, the present practice of using the theoretical capacity would be abandoned, and the load would be based on the axle capacity.

Place Big Rail Order at $57

Philadelphia, March 9.—Orders for 15,000 to 25,000 tons of rails were placed in the past week by eastern roads at $57, mill, for the open-hearth rails.

Spikemakers Heavily Committed

Pittsburgh, March 9.—Makers of spikes in this district are sold against probable production over the next three or four months, and numerous inquiries are going a begging. The Erie railroad has inquired for 3500 kegs and the Chicago & Northwestern railroad has a couple of inquiries out calling for a total of 6700 kegs. Makers generally are quoting a minimum of 4.00c, base, on large spikes.

The Nonferrous Metals

	‡Copper	Future Straits N. Y.*	†Lead New York basis	Zinc St. Louis basis	Aluminum	Spot antimony	Nickel ingot
March 3	18.75	64.50	9.00	8.70	33.00	11.87½	43.00
March 4	18.75	62.25	9.00	8.65	33.00	11.62½	43.00
March 5	18.62½	63.50	9.00	8.75	33.00	11.62½	43.00
March 8	18.62½	62.50	9.50	8.62½	33.00	11.62½	43.00
March 9	18.37½	60.50	9.50	8.60	33.00	11.50	43.00

*Future shipment from Singapore or London.
†American Smelting & Refining Co.'s price.
‡Producers.

NEW YORK, March 9.—Sensational movements in sterling exchange rates and abrupt declines in the London metal markets dominated the metal markets here the past week. At the peak of the advance in sterling exchange last Friday, the English pound was worth $3.70 in American funds, representing an advance of 31c in a week and was more than 50c above the low level touched earlier in the year. At the same time, all metal prices in London declined. The drop in spot standard tin from March 2 to March 9 amounted to £39; future standard, £39 10s; spot Straits, £39; standard copper, £12 to £13; electrolytic copper, £5. Zinc was down £7 10s and lead nearly £4 but the latter two recovered substantially today.

Export business was almost impossible under such conditions and import business just about as hopeless. Domestic activity also was light. Consumers have been somewhat shaken in confidence by the ups and downs of the markets and several are holding back their requirements for the next three months, awaiting more stable prices. The leading copper producers sold March delivery copper down to 18.37½c and 18.50c delivered today, 18.622c delivered for second quarter, 18.87½c third quarter. Second hands offered copper as low as 18.25c, f.o.b. refinery, but such offerings appear to have been largely for show purposes and not much metal was available at this figure. Casting copper is 18c, lake 18.75c. The severe decline came today on competition between big producers, despite good sales to brass mills last week.

Zinc softened, due to light domestic demand and inability of exporters to do any business with England after the decline abroad. By March 8 it was possible to buy second quarter shipment prime western at 8.50c, East St. Louis, from dealers, while prompt March held at 8.55c to 8.62½c. Today the market was stronger 8.60c, all positions. High grade sold at slightly under 9c, East St. Louis.

The American Smelting & Refining Co. advanced its lead March 6 to 9.50c, New York, 9.25c, East St. Louis, this being the nineteenth successive advance by this interest since May 16, 1919. This is by far the record for continued strength in the lead market. The outside market, which has led the leading interest all along, quoted 9.37½c to 9.50c previous to the announcement of the advance, and after the announcement went to 9.50c to 9.62½c, New York. Lead has remained in a strong position in spite of the abnormally high prices, due to curtailed production. Sheet lead also was advanced ¼c a pound to 12.50c for cut sheets and 12.25c for full sheets.

Tin was decidedly confused and irregular, prices sometimes varying 2c to 3c a pound from one day to the next. On March 2 65c was done on future shipment Straits; on March 9 the same position might have been done at 60c to 60.50c. Domestic consumers held aloof, viewing with askance the evident manipulation in London, and doubting the ability of the Singapore interests to hold the world market up by their own strength.

Antimony is lower. Aluminum is unchanged.

Brass products have not yet changed, despite cheaper copper.

Sheet Bars Still Rising

Automobile Interests Bid Up Open-Hearth for Conversion to $90 and $92—Various Tonnages Closed—Finishing Mills More Conservative

Pittsburgh, March 9.—While the scarcity of all kinds of semifinished steel is as acute as it has been at any time recently and no easing is observed in prices, a slightly more conservative feeling recently has developed. One of the sheetmakers who recently has been taking on tonnages of sheet bars regardless of their cost from customers anxious to get early tonnages of finished material, is showing a disposition now to go carefully on such business. Sheet consumers who are not good and regular customers of this company cannot have much conversion business accepted and a case also is reported of another sheetmaker declining to convert some bars on the ground that they commanded a price that could not fail to further inflate the prices of the finished material. As high as $90 recently has been done on open-hearth sheet bars under conversion deals with automobile builders who have bid for steel of this grade almost without limit. This figure was paid by a large Detroit builder who sought 3000 to 5000 tons. It now is reported that even $92, Pittsburgh, was paid lately on 5000 tons by another leading Detroit automobile interest. It is doubtful if mills on their own account would pay within $15 a ton of those figures. The high prices have been done on open-hearth steel since sales of bessemer bars at $70, Pittsburgh, have been made in the week.

Rerolling billets are quotable from $65 to $70 on sales but here again the element of conversion enters into the price. No finishing mill, unless secured by sale of finished material at a price based on the price of the billets, will pay as high as $70 for the steel. It is a common experience to have finishing mills decline rerolling billets when first offered them and then upon sales of bars or some other merchant mill product at a price that shows a profit on the cost of the steel come back and take the tonnage.
to come back and take the tonnage. readily are salable to domestic users at $70, Pittsburgh, and $80 recently was declined on an export inquiry for 500 tons of ordinary bessemer rods. Soft free-cutting bessemer screw stock rods can be sold readily at $80 while high carbon rods still are quotable on sales anywhere from $75 to $100.

Lack of coal and gas has seriously affected steel works operations both here and in the valley districts. Scarcity of cars also remains a factor, in that it is holding up the delivery of large tonnages of material.

Auto Builders Bid Up Prices

Cleveland, March 9.—Sales of open-hearth sheet bars reported from Pittsburgh last week at $90 Pittsburgh have been duplicated in this territory the past few days. Several thousand tons of such bars for April shipment to sheet makers in the Cleveland and northern Ohio district have been closed at this figure as well as smaller lots of bessemer bars at $70 Pittsburgh. These sales total 5000 to 10,000 tons. The spread of $20 per ton between open-hearth and bessemer sheet bars is phenomenal and may be ascribed to the great demand for automobile sheets which are of open-hearth quality. Automobile interests unable to obtain sheets have been bidding almost without limit for open-hearth sheet bars which they are furnishing to certain mills for conversion. One steel maker received intimations that $100 would be paid for a lot of bars but did not have the material to offer. One of the large Detroit automobile builders recently sought 3000 to 5000 tons of such bars in this district and is understood to have placed these at Pittsburgh. A second large Detroit interest inquired for 5000 tons. Sheet bar offerings at present are limited to only two or three makers and some of the latter are only temporary sellers of semifinished steel on account of the congestion of their finishing department. A Mahoning valley producer recently sold about 4000 tons. Some makers of semifinished steel have fixed upon $65 Pittsburgh for open-hearth slabs and $67 for open-hearth sheet bars as the settling prices for March delivery with regular customers who are under term of contracts with them. A Chicago mill recently offered slabs in this territory at $60 Chicago.

Rerolling Slabs Sold at $62.50

Philadelphia, March 9.—A large tonnage of rerolling slabs was sold in this district in the past week at $60 and $62.50, Pittsburgh, for the second quarter. Several round lots of forging billets for the second quarter were sold at $70, Pittsburgh. The minimum in rerolling billets is now $60, but only a small tonnage was sold in the past week. Forging billets were reported to have been sold at $80, but the report is not confirmed. A leading eastern producer is now sold up on 4 x 4-inch and 5 x 5-inch rerollers.

Buyers Bid Up Strip

Pittsburgh, March 9.—The present market in strip steel is a wheel within a wheel. Insistent demands for early tonnages of both cold and hot-rolled steel still are pouring in upon makers, who can accept such business only by making open market purchases of billets, since current receipts of the latter against contracts are barely sufficient to meet old obligations. Every open market purchase of billets gives additional strength to prices. Today, none of the makers of cold-rolled strip is quoting less than 8.50c, base, Pittsburgh, while sales at a premium of $10 per ton and even more over that figure are reported. As recently as a week ago, some makers were taking business as 8.00c, base. A minimum of 5.25c, base, Pittsburgh, now is quoted on hot-rolled strips, but that price by no means is maximum, sales being reported of prompt tonnages up to 6.50c, base. The price at which makers can cover sales by billet purchases governs the selling price of the hot-rolled strips. Shortage of cars still is seriously curtailing shipments against old orders and practically no cold-rolled steel is moving to New England. While permits are being issued, which are being honored by the Pennsylvania railroad, they will not be accepted by the New Haven railroad. None of the cold mills in this district, however, are idle this week as a result of the New England shipping situation.

New Method

Of Quoting at Delivery Adopted by Leading Wire Maker

Chicago, March 9.—Although the leading maker of wire and nail mills has held steadily to the 3.00c and 3.25c bases respectively announced a year ago in spite of the higher figures asked by competitors a break in the situation seems to be foreshadowed. Tonnage of wire and nails now being booked carry a provision that the price shall be that prevailing at the time of delivery. Inasmuch as wire and nails are sold for short periods only, whatever change may take place is likely to come soon. The only new business now being taken is for regular customers who are not covered by previous contracts. The railroad situation is improving somewhat and car supply is better, causing material to be despatched to users in a better volume. However, deliveries are not sufficient to meet demands and both jobbers and consumers desire much more material than can be furnished.

Shipping Situation Still Bad

Pittsburgh, March 9.—Although a few more cars have been available in the past week for the movement of wire and wire products than in the previous few weeks, the situation in this direction remains far from normal and practically all makers have from three to four weeks' production piled up awaiting cars. Evidently the congestion in the shipping departments of the makers in this district has not exhausted storage space, as mill operations, with the exception of one company here, remain at a comparatively high rate. Because of the transportation situation and the fact that old obligations are not being reduced very rapidly, new business is being largely declined. Heavy demands are still coming out for nails and on both plain and barbed wire considerably more business is being declined than is being accepted. This condition probably will remain so long as cars are hard to obtain for the movement of finished material. On account of the extremely severe winter it is believed that farm fencing has suffered badly and expectations run strong to some big demands for fence wire from the agricultural regions.

Negotiations recently were completed whereby the plant of the New Castle Stamping Co., New Castle, Pa., passed into new hands.

Exporters Hold Off Contracts

Not Interested in Third or Fourth Quarter Business at This Time—Some Talk of Slightly Easier Prices—Rails Feature New Far East Demand—Foreign Sales Have Increased in General

NEW YORK, March 8.—Fourth quarter, or even third quarter, business is not very attractive to the exporters. They claim that this is no time to contract with mills for future business because the price level continues too high and it is believed that material may be purchased more cheaply within a few months. There has been a material improvement in deliveries due to the betterment of the car situation. This has brought out some stocks of material that are being quickly taken. There is no dearth of demand for goods which can be delivered immediately. A revival in trade has been noticed with the Far East.

The East Indies have been prominent in the market for railroad equipment and several thousand tons of light rails have been sold to that destination within the past week. There is also considerable demand for light steel for general commercial use, including plates. The main requirements, however, outside of rails are for steel bars, sheets, bolts and nuts. Sheets are particularly difficult to obtain. A notable feature in the export market just now is an extraordinary demand from Japan for 30-gage sheets. Exporters are unable to secure the required gage. Some 26-gage is obtainable in limited quantities and 28-gage may be obtained with difficulty.

It is still difficult to procure mild steel bars, sheets and plates. Exporters report that wire nails are easing up, but they anticipate that the latter will command from 7.50 to 8.50 cents, base, even when they are procurable in quantities. This is the price, at least, which must be paid for second quarter business. Billets which have been selling at $45 f.o.b., seaboard, are now being offered for $46. Tin plate has been extremely scarce and the Oriental demand has been tremendous. Despite this situation it was learned that 10,000 cases of tin plate were purchased last week at $10.25 per base box.

European business is at a standstill due mainly to the exchange situation. Some encouragement was lent by some indefinite rumors from Europe to the effect that France and England were planning to meet their first maturities in the United States in cash. Sterling and francs immediately advanced but the recovery had merely a moral effect, and little, if any, practical benefit. Some exporters insist that they could still dispose of some iron and steel in Europe were the supplies available, despite the exchange. But most export houses cannot depend upon their steel trade alone to keep them going and their other lines are closing out. The situation has become so serious that reports of the embarrassment of some companies were current during the week, it being said that an important export house is about to suspend. Exporters became so apprehensive over this situation that a conference of one group was called at which the proposal was made to join forces for the purpose of establishing a bartering system with clearing houses abroad. Various schemes of financing export business were discussed but it was impossible to find any common ground of action.

It was pointed out that the English are expecting sterling exchange to go back to par within six months and if credits could be extended them for that length of time our trade relations would be preserved. One exporter proposed the acceptance of foreign bonds in payment for American goods, these bonds being passed on to the American stockholders in the form of dividends. Another manufacturer said that he proposes to ship his raw material to Europe and manufacture his product there.

While there appeared to be a better sentiment in the steel export market during the past week, all apprehension has not been dissipated. It was pointed out that prices have not advanced and in some instances it was believed that there is a tendency toward a decline. The exporters insist that there must be a decline before exporting opens up upon a sound basis. The mills are hurrying deliveries, but the exporters refuse to contract for material to be delivered during the last half.

The demand for railway equipment was the feature of the market during the past week. The light rail demand from the Far East has been due to the resumption of mining operations. The inquiries received from oil fields abroad have also been insistent and large, and some sales have been made, especially to Mexico. According to a cable report an American firm has obtained a contract in Peru for an extensive irrigation project. The work will require all of five years and it is confidently believed that much of the material will be purchased in the United States. Otherwise the South American demand has been negligible and for the usual commodities. A sale of 60 tons of galvanized pipe to Cuba was noted last week. This sale was made out of stock.

Manchuria has asked for 10,000 tons of 100-pound rails. The price at which the rails are being quoted was not mentioned, but it is understood to have been a shade better than $75 a ton, c.i.f. This is approximately $30 a ton less than a specific offer made by a jobber last week. One exporter said that the Japanese had offered as high as $100, c.i.f., for light rails without obtaining any. It is known that one inquiry for 12-pound rails calls for 20 track-miles, which is equivalent to about 400 tons. The sale of one locomotive to the Far East was noted last week.

An exporter shipped 800 low-priced automobiles to the Far East, and placed orders for 150 more of the same class. Machinery demands are also heavy, it being stated by one house that inquiries for approximately $750,000 of textile machinery were refused. The demand for materials of which the Orient is in constant need has grown to large proportions. It was stated by one exporter that he could place today orders for 30,000 tons of ship plates and approximately 100,000 kegs of nails were the mills in a position to accept them. This exporter is holding a firm inquiry for 100,000 kegs of nails which is to be placed immediately the material is available.

Some of the smaller export houses which made a practice of dealing in more modest orders report the placing of business upon a lower price basis than at any that has existed since the first of the year. For instance, it was reported that an order for wire rods had been placed at $75, mill.

Sheets have been extremely scarce and it is feared that the recent increased export demand for this material will tend to maintain the present high prices. A sale of 500 tons of blue annealed sheets was made to Japan last week, it being reported that the price paid was 6.50 cents, mill. The same agency sold Japan 1000 tons of bars at a price reputed to have been better than 4.00c, New York.

One agency reported having shipped 75 tons of pipe to Japan upon a contract which was let some time ago. A new Japanese order for a carload of 8-inch pipe was filled out of stock.

China has approached the market with an inquiry for 5000 tons of 25-pound rails. It was said there is little hope of filling the order at present.

Furnace Makes Record

THE No. 3 blast furnace of the Ensley works of the Tennessee Coal, Iron & Railroad Co. has been put out for relining after a campaign of 10 years 7 months and 9 days. During that time the furnace produced 1,429,788 tons of pig iron, which establishes a world's record on one lining. There has been passed through this stack in that time 5,999,438 tons of raw material.

No. 2 blast furnace, Ensley works, which was blown out Sept. 14, 1918, produced 1,196,358 tons of pig iron on one lining. The No. 3 furnace was rebuilt and blown in in 1909 and the No. 2 furnace in 1910.

Shipping Board

Releases Restrictions on Its Ships—Rates May Go Down

Washington, March 9.—Sharp competition from British and other foreign shipping nations, growing keener as the building of new tonnage progresses, has caused the United States shipping board to throw down the bars on ocean freight rates. It has given up entire control of rates on its vessels leased to private operators. All of its tariffs were cancelled on March 1. By this action the government has released all restrictions on its ships.

For some time there has been a tendency toward reduced ocean freight rates. Foreign shipping interests have been earnestly seeking, and with considerable success, more business through cutting rates, and this developed to such an extent that it was recognized that American bottoms operated under leases from the shipping board and under regulated rates could not be expected to meet the rivalry. Privately owned and operated American vessels also were hurting the business of the government vessels through lowering rates.

The rivalry between American and foreign shipping now is becoming intense, with American ships at a disadvantage because of their higher operating costs. What the result may be is a question, but it may hasten the adoption by congress of a policy for the establishment of an American merchant marine, compelling it to give aid, through subsidies, or preferential duties, unless resort is taken to government ownership and operation, which is thought to be unlikely if the American merchant marine is to be preserved.

Managers of steamship companies take the view that the shipping board has acted wisely and that improvement will be reflected in the shipping market, provided sufficient encouragement is given to American shipping by congress. It is well known that six months ago there was more freight offered vessels leaving United States ports than they could carry. Today, it is stated, they leave with only about one-half of their cargo space filled, and with piers empty, a condition that has resulted in rerouting of some steamship lines. With the cancellation of the shipping board tariffs, all American vessels will have to compete sharply for business, with shipping board vessels still being operated, however, on the profit sharing basis.

By this policy, operating agents are allowed under contracts to retain 10 per cent of all net profits up to 50 cents a ton a month. On net profits in excess of 50 cents a ton a month and not more than $1 a ton, the agent retains 20 per cent, while on all profits of more than $1 a ton a month the agent retains 25 per cent.

Will Erect Galvanizing Plant Near Canton

A new plant for galvanizing sheets and fabricating them into formed roofing and other products will be built by the Louisville Sheet Steel Co. on a 25-acre site, eight miles east of Canton, O. Ground will be broken as soon as the weather permits and it is planned to have the plant in operation within three months. Buildings and equipment will represent $225,000.

Officers of the new company are: Dr. James Fraunfelter, president; H. E. McCoy, vice president and general superintendent; J. W. Lucas, secretary and sales manager; H. L. McKenzie, treasurer and general manager, and F. C. Negley, assistant secretary and treasurer.

J. W. Lucas formerly was associated with the J. M. and L. A. Osborn Co., Cleveland, metal jobber. F. C. Negley formerly was connected with the Hydraulic Pressed Steel Co., Cleveland. H. L. McKenzie was associated for 13 years with the Berger Mfg. Co., Canton, and for the past eight years with the Canton Corrugating Co., a subsidiary of the Canton Sheet Steel Co., Canton, O. H. E. McCoy for 13 years was in charge of the American Sheet & Tin Plate Co.'s Vandergrift, Pa., plant and for the past 10 years was superintendent of the galvanizing department of the Berger Mfg. Co., Canton, O.

Will Locate in Warren

An offer of a free 5-acre tract by the Warren, O., board of trade has been accepted by the Alloy Electric Steel Casting Co., Massillon, O. It will begin construction of a plant to manufacture jobbing and mill work, automobile parts and a general line of castings. Backed by Massillon capital, the company has elected the following officers: President and general manager, N. L. Coxey; vice president, A. T. Ranck, and secretary and treasurer, J. S. Corey Jr.

Dismantling Stack

The site occupied by the plant of the Detroit Furnace Co., Detroit, comprising four acres, has been sold by the Hanna interests of Cleveland to the United States Rubber Co. for the latter's Morgan & Wright division and the blast furnace stack on the property now is being dismantled. The furnace property was acquired by M. A. Hanna & Co. several years ago and has been operated by the latter in connection with the stacks of the Detroit Iron & Steel Co. The furnace was of small size 12½ x 62½ feet, was erected originally in 1870 and was rebuilt in 1902-03 and remodeled in 1906. It had a daily capacity of about 80 tons of iron. It last was active during the latter part of August.

Not to Begin Plant

New York, March 9.—In regard to the published report from Gary, Ind., that the National Tube Co., will begin work immediately on a new tube plant to cost $40,000,000, E. H. Gary, chairman of the United States Steel Corp., states that this is unfounded. The corporation set aside its plans for building the plant some time ago, and while it expects to carry out the plans eventually there is no intention to begin work at an early date. The report sent out from Gary was to the effect that work will be started this week on four large blast furnaces, to be followed by tube mills, and other structures.

Extends Mill Capacity

The Massillon Rolling Mill Co., Massillon, O., has let a contract to the Belmont Iron Works, Philadelphia, for the structural steel work for new mills which will increase the company's output of automobile stamping sheets by 50 per cent. The new mills will be in operation Sept. 1. The extension will include an annealing building, 65 x 540 feet, and a hot mill building, 70 x 780 feet.

Speeds Up Construction

More open weather has resulted in a considerable speeding up of the construction of the new open-hearth furnaces and the blooming mill of the Weirton Steel Co., Weirton, W. Va. With the completion of the present construction, this company will become largely self-contained in the matter of steel supplies. It has its own blast furnace, which was lighted last summer, and is the first of four which the company plans to construct. Work on the second stack is expected to begin with a decline in material and labor costs.

Decision May Hasten New Laws

Congress Silent on Supreme Court's Ruling in Steel Corporation Case, but Interest in Proposed Federal Licensing System Is Being Revived—Sherman Law Not Nullified by Decision—Court's Policy Is Unchanged

WASHINGTON, March 9.—Decision last week by the United States Supreme Court favorable to the United States Steel Corp., has led to considerable speculation as to what effect may be imparted upon the tendency of national legislation as it relates to business, especially big business.

Minds which perhaps are to be credited for their imaginative qualities rather than for sound judgment have formed various conclusions as to the significance of the decision. For the most part so-called interpretations placed upon the majority and minority opinions of the court have dealt with the possible change it might reflect in that tribunal's policy in trust cases. The greater portion of these attempted analyses have seen in the decision a more liberal attitude in such cases by the court. It is difficult, however, to accept this conclusion because it must be kept in mind an unusual chain of circumstances surrounded the two opinions.

At the outset it may be pointed out that only seven of the nine members of the court participated in the decisions, Justice McReynolds and Justice Brandeis taking no part in them for reasons well known. The decision was favorable by a majority of only one, four justices holding the Steel corporation has not violated the provisions of the Sherman law, while three held to the contrary. Had either Justice McReynolds or Justice Brandeis participated in the decision, concurring with the minority, as unquestionably he would have done, and a tie vote resulted, the decision still would have been favorable to the corporation because by the rules of precedent it would have automatically affirmed the finding of the lower court, which was favorable to the corporation. But had both Justice McReynolds and Justice Brandeis taken a part in the decision it would have been unfavorable by a vote of five to four against the Steel corporation.

Because of this fact it is held to be going outside the limits of logic to say that the Supreme Court, as a whole, if at all, has pursued through the result of the decision a more generous attitude in its construction of the Sherman law. Further combatting such a theory is a statement that has come from an authoritative source entirely too important to disregard. This statement is to the effect that the policy of the Supreme Court is and will continue to be the same as that enunciated in decisions in the Standard Oil Co., and American Tobacco Co. cases, which were adverse to those combinations. This does not imply that the court as a whole would not distinguish between "good" trusts and "bad" trusts, although had it voted its full strength the fact cannot be escaped that the Steel corporation would have been classed by the majority as being in the latter category.

While there may be some foundation for the belief that the majority opinion actually did to an unusual degree emphasize the fact that public interest is of paramount importance and that mere size does not constitute violation of the law, and thus brought forth a more moderate policy than may have obtained in the past, legal minds here assert that the decision did not place a new interpretation on the Sherman law. They maintain that it only held that the Steel corporation had not violated the law, and in so doing, it is added, the "rule of reason" was applied once more.

Taking up the question as to what effect, if any, the decision may have on the trend of national legislation toward business, it again is difficult to discern that it carries any particular significance. Strangely enough, congress has been silent on the decision, even the coterie of baiters of big business keeping quiet. But it appears to be possible at least that it may have the effect of accelerating certain legislation concerning business, if not being the cause of such action. Reference is made especially to a recommendation made some time ago to congress by President Wilson for legislation for federal chartering through a license system for business interests of the country. Legislation of this kind appears to be favored by many business concerns of the country, as it is by Attorney General Palmer and the federal trade commission. The recommendation is not a new one by any means. It was suggested by Theodore Roosevelt, and by James R. Garfield, when the latter was commissioner of the old bureau of corporations. The Steel corporation decision may stimulate popularity for this kind of legislation and bring about its enactment.

The decision also may increase the tendency of the department of justice to settle so-called trust cases without resorting to litigation, a tendency that has been expressed in the recent case of the packers, the result of which was to take from them their so-called by-products business.

Attorney General Palmer, Judge C. B. Ames, in charge of the antitrust division of the department of justice, and others in that department are studying the Supreme Court findings in the Steel corporation case, it is said, with a view to shaping future activities with regard to pending antitrust litigation. It is reported that the attorney general may report the entire situation to the President and might make a public statement.

The Supreme Court majority decision has created comment in another direction. This relates to the question as to wether it will encourage the organization of other combinations, such as, say, among independent steel companies. The majority opinion not only did that, but charged that it would be inconsistent to break up the corporation into units for domestic trade while at the same time reserving to it the right to combine for foreign trade under the Pomerene-Webb export act. But the minority opinion, it is asserted, together with the technical fact that the majority of the Supreme Court would be against the Steel corporation had all nine members voted, might militate against encouraging combinations. It will be remembered, however, that congress in the recent Esch-Cummins railroad act authorized consolidation of rail systems.

House Votes to Promote Foreign Trade

Washington, March 9.—Responding to demands from Secretary of Commerce J. W. Alexander, the Chamber of Commerce of the United States, and business interests generally, the house of representatives last week by a vote of 210 to 39 inserted in the legislative, executive and judicial appropriation bill a provision for the continuation of the service of 12 com-

mercial attaches, for which $165,000 was allowed. By doing this the house rejected the socalled retrenchment policy of the committee on appropriations, which struck this important item from the bill. The house also rejected the recommendation of the appropriation committee and increased the sum to promote and develop foreign commerce from $175,000 to $325,000, this being voted on by acclamation.

Reference was made to the manner in which other countries, instead of limiting plans for developing foreign trade, are expanding them, England, for instance, providing for 60 commercial attaches. The bill as finally passed added $400,000 in appropriations for the bureau of foreign and domestic commerce.

Oppose Introduction of Metric Bill

FIVE reasons why metric legislation should not be introduced at this time are set forth in a brief submitted on behalf of the American Institute of Weights and Measures to the house committee on coinage, weights and measures through its chairman, Representative Albert H. Vestal. These reasons, which are given in full elsewhere on this page, argue against the introduction of prometric legislation rather than against the evils of the metric system.

The first argument to the effect that industry is now loaded to the limit with burdens, points to the fact that the vital and vexing questions arising from the war and with which the industries of the country have to deal are burdening them to an extent approaching the breaking point. Industry should not be given the added responsibility of preparing for hearings in order to defend its interests. The brief points out that at a time when most urgent appeals including those from the federal reserve board are being sent out for a speeding up in production, any measure which would tend to retard production and to increase expense both to the government and to private industry should require the most cogent and urgent arguments in its behalf to be given consideration in the face of such interference with production and such increased expense.

Letters substantiating this statement from Henry M. Leland, Lincoln Motor Co., Detroit; B. H. Blood, Pratt & Whitney, Hartford, Conn., and Robert Garland, Pittsburgh chamber of commerce are abstracted in the brief.

The second argument is stated as follows:

"The activities which have brought about requests for the enactment of metric legislation can be traced largely, if not wholly, to the work of the so-called 'World Trade Club of San Francisco' which in a campaign that has been liberally financed mainly by a single individual, has spread broadcast through the country, literature of a sensational and misleading character which reaching many persons who have not been in a position, or have not taken the time, to give thought to the matter has influenced them to sign petitions which were enclosed with the literature, expressing themselves as favoring metric standardization . . . "

In explaining the third reason, the brief states that ample information on the subject of metric measures was accumulated in congressional hearings in 1902 and 1906, and intimates that this testimony is still available. It also is stated that a parliamentary committee in England reported in 1917 that it was "unable to recommend the adoption of the metric system."

Referring to the fourth point, the brief reads:

"There is now full privilege granted by law to use the metric system to any extent that it is found useful either in science, in manufacturing, or in foreign trade. . . . The manufacturer is ready to let the scientist or professor use whatever system he finds to be of advantage. We ask that they in turn shall not dictate to manufacturers but shall be equally ready to let our great industrial interests determine what is for their own advantage."

In support of the fifth point, the following statement of Henry R. Towne, Yale & Towne Mfg. Co., Stamford, Conn., is given:

"The English speaking countries, the United States and the British empire, have more capital invested and more people engaged in industrial pursuits based on the English system of measurement, the inch, than all the metric speaking countries put together on the basis of the metric system. The markets of England, Canada and the English colonies constitute a very large fraction—nearly 50 per cent (now more than 50 per cent as Mr. Towne's figures were based on conditions before the war) of the foreign markets for American manufactures. These markets use the English inch."

Submit Five Arguments Against Bill

IN THE brief submitted to the house committee on coinage, weights and measures by the American Institute of Weights and Measures, the following reasons for not introducing metric legislation at this time are given:

1—Industry is now loaded to the limit with burdens and should not have others added.

2—What call there is for metric legislation is of artificial creation and there is no real demand for it.

3—Much time and money already have been spent both in America and England in hearings on this subject and the records of these are now available for reference without incurring additional expense for further hearings.

4—The law now provides full opportunity for the use of the metric system to whatever extent the interests of manufacturers and commerce require so that further legislation is unnecessary.

5—There should be no measures introduced for metric legislation in this country without first coming into full accord with other countries using our present basic standards.

Coal Priority Rule Is Re-established

WASHINGTON, March 9.—While the President is silent on the subject of coal and coke prices which were fixed by Fuel Administrator Garfield before his resignation and which have not been canceled or modified, he is continuing to reinforce Director General Hines with authority. In a new executive order issued March 5, the President amplified the authority given to Mr. Hines in the previous order of Feb. 28. The latest order from the White House specifically mentions the director general shall observe the priority arrangements made by Dr. Garfield for Mr. Hines' guidance when he was originally given the distribution func-

tions of the fuel administration. In accordance with this statement, Mr. Hines has again made public the list of priority consumers, and again named committees in the various regions of the railroad administration to handle the diversions and to take care of emergency requirements as they may arise. These committees are revived for the eastern section of the United States and are necessary, Mr. Hines says, because the severe weather conditions continue to interfere with railroad operations and the subsequent movement of fuel to consumers.

The committees have been instructed to keep diversions at a minimum and to cease making them at the earliest possible moment. They are to have the necessary authority in their respective regions and are to continue under the general directions of the director general himself. G. N. Snider is chairman of the eastern regional coal committee, W. T. Lamourne, chairman, and James J. Storrow, vice chairman of the New England district coal committee; H. A. Worcester is chairman of the Ohio and Indiana district coal committee; P. G. Findlay, chairman of the Detroit committee; E. R. Bissell, the Cleveland committee; Samuel Porcher, the Allegheny regional coal committee; and D. E. Spengler, the Pocahontas regional coal committee. Mr. Hines' instructions to the committees are as follows:

The director general of railroads, acting under authority of the executive orders of the President of the United States, dated Feb. 28, 1920, and March 5, 1920, and of the act of congress therein referred to and approved Aug. 10, 1917; in order to reduce to a minimum the diversion of coal necessary to supply the actual needs of essential consumers hereby orders and directs as follows:

1. That all producers and shippers of bituminous coal now or hereafter under contract to furnish such coal to consumers and dealers within the United States, gives preference in the shipment of such coal to such consumers and dealers, to the extent necessary to supply their actual current needs, in the order prescribed in the preference list included in the order of the United States fuel administrator of May 25, 1918, as follows:

(a) Railroads.
(b) Army and navy, together with other departments of the federal government.
(c) State and county departments and institutions.
(d) Public utilities.
(e) Retail dealers.
(f) Manufacturing plants on war industries board's preference list.
(g) Manufacturing plants not on war industries board's preference list.
(h) Jobbers.
(i) Lake.
(j) Tidewater.

2. That the following committees be and hereby are designated the representatives of the director general to carry into effect the foregoing provision of this order and be and hereby are further empowered as his representatives to make such diversions of coal in possession, as common carriers, of railroads operating in the United States to the extent that it is necessary in the present emergency to provide for the emergency needs of consumers and dealers in the first five classes of the United States fuel administrator's preference list herein referred to, which diversion shall be made in accordance with the rules heretofore governing the activities of these committees or such modifications of these rules as may be hereafter made.

Thence follows the names of the committeemen, with chairman as stated. The President's order of March 5 is as follows:

By virtue of the powers conferred upon me by the act of congress approved Aug. 10, 1917, entitled "An act to provide further for the national security and defense by encouraging the production, conserving the supply, and controlling the distribution of food products and fuel," and of all other powers hereto enabling, and particularly for the purpose of carrying into effect the provisions of said act relating to fuel, Walker D. Hines, the director general of railroads, his successor in office, and his representatives, in addition to and in continuation of all powers and authority granted him and them in executive order of Feb. 28, 1920, and the orders of the United States fuel administrator, dated Oct. 31, 1919, and Dec. 8, 1919, are hereby authorized and empowered to make diversions of coal in the possession, as common carriers, of railroads operating in the United States, to the extent that it is necessary in the present emergency to provide for the requirements of the country in order of priority set out in the preference list included in the order of the United States fuel administrator of May 25, 1918; and are hereby further authorized and empowered to establish rules for the regulation of and to regulate the method of production, shipment, distribution, apportionment or storage thereof among dealers and consumers within the United States; provided, however, that this order shall not be construed as applicable to the export of coal from the United States, power over which was conferred upon J. W. Howe, Rembrandt Peals, F. M. Whitaker and J. F. Fisher by the executive order dated Feb. 28, 1920, reinstating the order issued by the United States fuel administrator dated Nov. 5, 1917, relating to the Tidewater Coal exchange.

An announcement in regard to an increase of vessel rates may not be expected until the opening of lake navigation. Operators will have a committee take up with the railroad officials the question of reducing rail rates from mines to docks in the Lake Superior district when the roads have been returned to their owners.

Freer Supply

Of Spot Benzol Offered—Coal By-Products Prices Unchanged

New York, March 8.—Benzol deliveries continue to improve. Whereas a few weeks ago, sellers were considerably behind on their shipments, they are today fairly well caught up. This has resulted in a somewhat freer supply of spot material. However, there still is not much of this available. While many of the larger consuming interests have contracted for their requirements for 1920, the smaller buyers continue in the market, contracting in the main for substantial quantities of benzol. Both pure and 90 per cent benzol are unchanged in price, the former quoting at 27 to 31 cents per gallon, and the latter, 23 to 25 cents. Toluol is also in good demand, with prices unchanged at 28 to 32 cents, for spot and contract.

Scarcity still prevails in solvent naphtha. One large seller at this time is temporarily out of the market. While this situation is not likely to prevail for any length of time, buying by the rosin extraction interests has been of sufficient volume, it is believed, to make for a tight market for at least two or three weeks more. The shortage in naphthalene also continues in evidence, there being but few spot supplies of either flakes or balls. The market, however, is unchanged at last week's advance of 8 to 9 cents, for flakes. Naphthalene balls are quoted at 9½ to 10½ cents.

Sulphate of ammonia continues dull. Foreign inquiries are fairly numerous, but little business of this character is being booked. Some domestic sales are also being made, but these are for spot shipment. Prices on spot sulphate of ammonia continue around $4; the future market is nominal.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants

Pure benzol	$0.27 to .31
Toluol	.28 to .32
Solvent naphtha	.22 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	0.08 to .09
Naphthalene, balls	0.09½ to .10½

Per 100 Pounds at Producers' Plants

Sulphat of ammonia	$4.00

Contract

Pure benzol	$0.27 to .31
Toluol	.28 to .32
Solvent naphtha	.22 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	0.07 to .08
Naphthalene, balls	0.08½ to .09½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	nominal

Business Men Plan War on Reds

National Organization May be Formed to Promote Good Citizenship and Prevent Class Legislation in Interest of Radicals—Californians Promote Meetings in St. Louis, New York and Chicago, Asking for Support

NEW YORK, March 8.—Business men from 12 states responded today to the call issued by H. M. Haldeman, president of the California Commercial Federation, for a conference to inaugurate a national movement to participate in politics and educational work to combat radicalism in this country. Twenty-seven persons attended the conference and Mr. Haldeman's secretary said they represented the states of New York, Maryland, Pennsylvania, Oklahoma, New Jersey, Wisconsin, Missouri, Nebraska, Arkansas, Michigan, Illinois and Massachusetts.

The general tone of the speakers indicated their belief that any projected national organization designed to combat radicalism should be kept out of partisan politics, but nearly all indicated a willingness to join in the movement if its objects are to be purely informative and educational, and the inculcation of the principles of good citizenship.

A committee was named to devise a plan of national organization which will report to the meeting tomorrow. Among those who told what local organizations have been doing along lines of promoting good citizenship were Henry F. Baker and Edmund S. Dickey, of Baltimore; W. P. Barba, of Philadelphia, and Alvin F. Johnson, of Omaha. The California proponents of the plan consumed most of the speaking time. They included Mr. Haldeman, E. F. Treafz, of Los Angeles, and F. W. Stow, of Santa Barbara.

The New York conference follows similar meetings already held in the Pacific slope states, and the Trans-Mississippi states, and it is to be followed by a convention at Chicago, probably March 11, 12 and 13 at which the national organization may be created. Inasmuch as state organizations already are in existence in California, Iowa, Kansas, Minnesota, Massachusetts, Oklahoma, Arkansas, Texas and Louisiana, the prospect for the formation of a national organization are considered bright.

To Offset Work of Radicals

The proposed national organization is intended to wield an influence which will have the effect of safeguarding the interests of the vast majority of the country's population, of tending to prevent vicious legislation at the dictation of any organized minorities, such as the American Federation of Labor, to promote understanding and co-operation between groups, such as employers and employes, and of fostering of Americanism.

It is for the purpose of fighting pernicious influences, wherever they are active or may become active in this country, in public and business life, that the proposed national organization is to be brought about. While its organizers are leading business men and employers in various parts of the country, their intention in no sense is to restrict membership. As a matter of fact it is intended merely to make the new association representative of the interests of the vast majority of the citizens of this country, and it will be open to participation by any citizen who desires proper government and conduct.

Perhaps the best illustration as to how the proposed organization is intended to function is reflected in the methods which have been pursued by the state organization in California. Some five years ago a group of leading employers and business men in Los Angeles county, chafing under the grip which organized labor had obtained on politics, and aroused by the activities of the Industrial Workers of the World, decided to conduct an organized fight to clean up the situation. The success that characterized their efforts astounded them. It was decided that the recipe was too good to keep. So about two dozen of the Los Angeles men, headed by H. M. Haldeman, president of the Pacific Pipe & Supply Co., made an automobile trip through the state, visiting 17 counties and organizing in each of them bodies similar to their own. The result was the formation, about two years ago, of the Commercial Federation of California.

This name really is a misnomer, for the word commercial is significant of nothing more than that the federation originally resulted from the organizing genius of Mr. Haldeman and other business men. But its membership also includes professional men and plain citizens. And its functions are to prevent the passage of class and undesirable legislation, to prevent the election of undesirable aspirants for office and otherwise to express the voice of the sound citizens of California. The results it has obtained reflect the efficiency of its work. On one occasion when 16 men were to be elected to go to the state legislature and to serve in various capacities in Los Angeles county, 12 of the 16 candidates recommended by the federation in Los Angeles county were elected. On another occasion when nine were to be elected to the Los Angeles city council, six out of the nine supported by the federation were elected. On still another occasion when seven men were to be elected to the Los Angeles board of education, four of the seven candidates selected by the federation were elected. These are but typical instances of the federation's success in securing the election of good men to office.

One of the things that the federation does is to maintain a bureau at Sacramento, the state capital, whose function it is to furnish information needed to enable the legislators to cast their votes wisely. It was found that it was not sufficient to secure the election of good men; it was necessary to give them aid in the discharge of their responsibilities. For instance, some 2000 bills came before the legislature at its last session and it would have been physically impossible for each member to analyze all of these bills in order to determine whether he favored or opposed it. Among the things that the federation's bureau does is to prepare an analysis of each bill submitted. In this analysis the meaning and intent of each bill is revealed clearly and concisely, and by this expedient a great many bad bills have been defeated.

Maintains Educational Bureau

The federation also maintains an educational department that concerns itself with the instruction that is given in the schools of California. The school is looked upon as the nursery of patriotism and loyalty, and care is exercised that there may be no text books containing radical or disloyal teachings or sentiments. Care also is taken that the teachers shall

not include any individuals of radical or revolutionary tendencies. On the other hand, the federation exerts itself to secure ample remuneration of educators of the right type. Supplementing this work, the federation has a corps of able speakers who take advantage of such occasions as are offered to stimulate patriotism.

One of the great purposes actuating the federation is the elimination of controversies between employers and employes, and the discrediting of radical labor leaders. It sends speakers where they are needed, and it seeks to show both employers and employes that their interests are mutual and that they have most to gain by understanding each other and working in harmony.

Some time ago the firemen of Los Angeles organized and obtained a charter from the American Federation of Labor. A committee from the Commercial Federation of California waited upon the firemen and inquired the reasons for their action. The firemen replied that they were not getting enough money and that they wanted their rights, and they thought that the only way to get them was through the American Federation of Labor. The representatives of the Commercial federation went into the matters at issue and found that the firemen had grievances. They promised that they would secure an advance in wages, and an adjustment of the other points at issue, through the city council, and the firemen were satisfied. Without waiting for a realization of the promise, they returned the American Federation of Labor charter. The Commercial federation prevented the unionization of the Los Angeles police by similar methods.

In its scheme of organization, the federation entirely resembles the state government. Each county has its own commercial federation, and each town or city may have a branch with such representation as the county board may determine. Each county is entitled to representation on the state board by one member for every assembly district in the state. The members in Los Angeles county alone have underwritten a total fund of $1,000,000, payable over five years, for carrying on the work in their county. The single subscriptions range all the way from $50 to $2500 a year. In Los Angeles county the federation has a membership running into many thousands.

Supplementing its other activities the federation publishes a weekly news letter and a monthly magazine. The news letter contains valuable "inside" information on congressional activities, real facts involved in industrial disputes, etc., and this is distributed to the members. The magazine, called *The Commonwealth*, is published by the Mutual Interest society, and is devoted to articles, designed to further understanding between employers and employes.

Puddlers' Wages Raised 76 Cents a Ton

Puddlers' wages were increased to $13.38 a ton for March and April, as compared with $12.62 for January and February, at the bimonthly wage settlement meeting in Youngstown, O., last week. Examination of the sales sheets of representative middle western bar iron mills for the 60-day period ending Feb. 20 showed an average sales price of 2.70 cents, as compared with 2.55 cents in the preceding period. The wages of finishing mill hands are correspondingly increased with the puddlers in the Amalgamated Association of Iron, Steel and Tin Workers. Following is a comparison of bimonthly price determinations since Jan. 1, 1917:

	1920	1919	1918	1917
Jan.-Feb.	2.55c	3.10c	3.10c	2.35c
Mar.-Apr.	2.70c	2.75c	3.30c	2.45c
May-June	....	2.50c	3.35c	2.65c
July-Aug.	....	2.50c	3.40c	2.75c
Sept.-Oct.	....	2.50c	3.45c	2.85c
Nov.-Dec.	....	2.50c	3.45c	2.95c
Yearly average	....	2.64c	3.34c	2.65c

Industrial Board Makes Final Report

Washington, March 9.—The second industrial conference adjourned sine die Saturday after having completed its report to the President which is now in the hands of the printer. It is expected the report will reach him late this week and that in about 10 days or two weeks it will be given to the public. The report is the unanimous opinion of the members of the conference.

The report differs but slightly from the tentative draft made public Dec. 19, it is said, and maintains that the proper place to deal with the labor problem is in the individual plant. There are some modifications from the original report, but the national industrial board and the regional boards of inquiry and adjustment remain intact. The final report is said to contain about 15,000 words.

Hot mill workers of the Farrell, Pa., plant of the American Sheet & Tin Plate Co., have been granted wage increases of 9½ per cent. A 10 per cent increase was given common laborers Feb. 1. About 3200 men are affected.

More Car Orders

Placed by Canadian Railways—New Ship Plate Mill Started

Toronto, Ont., March 6.—The Canadian National railways has placed orders for rolling stock and equipment amounting to approximately $25,000,000, according to D. B. Hanna, president of the system. These constitute one of the largest series of contracts placed in the dominion at one time for rolling stock, and together with the orders recently placed by the Canadian Pacific railway will insure much activity for Canadian car builders for some time. Orders for equipment for the National railways were placed as follows: Canadian Locomotive Co., Kingston, Ont., 45 locomotives; Montreal Locomotive Works, Montreal, Que, 67 locomotives; Canadian Car & Foundry Co., Montreal, Que., 18 sleeping cars, 12 dining cars, 20 baggage cars, 1000 box cars, 600 refrigerator cars and 80 cabooses; Eastern Car Co., Trenton, N. S., 500 box cars, 1150 coal cars and 6 snow plows; National Steel Car Co., Hamilton, Ont., 1500 box cars; Preston Car & Coach Co., Preston, Ont., 20 cabooses; Hart-Otis Car Co., Montreal, Que., 350 ballast cars.

The contract with the National Steel Car Co involves an outlay of about $4,500,000, and will keep the plant in steady operation for seven months. Other Hamilton firms will benefit as the company will place orders with them for 2000 tons of axles, 4000 tons of wheels, 3000 tons of steel bars and 200 tons of bolts. The Canadian Westinghouse Co. will furnish 200 tons of airbrake material. The National Steel Car Co. also has orders for steel sleeping cars for the Canadian Pacific, and contracts from India and Jamaica.

The Dominion Iron & Steel Co. has taken options on iron ore areas at Loch Lomond covering an area of about 35 square mills.

The new ship plate mill of the Dominion Steel Corp., at Sydney, N. S., has been formally opened. Official tests of the first plates rolled were made in the presence of Deputy Minister Alexander Johnston, of the Canadian marine department, and other officials. Up to Feb. 23 200 tons of plates were rolled. After inspection at Lloyd's the material will be shipped to the Halifax shipyards.

The ship plates are made from specially cast ingots, averaging in weight 3 tons each. Standard plates from ⅜ to 2¼-inch can be made up to widths of 98 inches and in lengths up to 80 feet. The mill has a capacity of 12,000 tons per month.

British Prices Moved Up Again

Makers Refuse to Consider Sales of Billets at Less Than 25 Pounds a Ton, While Sheet Bars Advance from 25 to 30 Pounds — Steel Strike Continues—Germany Organizes Export Price Bureau

The Iron Trade Review Staff Cable

Sterling—$3.60

European Headquarters,
THE IRON TRADE REVIEW,
16 Regent St., S. W. I.,

LONDON, March 9.—Sixty thousand steel workers are still idle in South Wales by reason of the strike and steelmasters decline to recognize informal notices served on them by the strikers.

Orders for steel generally are being refused, and orders for billets do not receive any consideration for a price less than £25 ($90.00). Tin bars and sheet bars are selling at £30 ($108.00). Many manufacturers using steel have suspended operations because of their inability to obtain material. A few American billets ordered last fall are just arriving. Tin plate is selling at 73 shillings ($262.80). Forty thousand boxes of American tin plates were sold recently in France.

Prices of the various grades of pig iron generally are advancing, 5 shillings (90 cents) at a time. The price of Northamptonshire iron for delivery in March advanced 5 shillings (90 cents), and for delivery in April, 7 shillings ($1.26). Staffordshire pig iron advanced 7 shillings, 6 pence ($1.35) for March, and 5 shillings (90 cents) for April.

Staffordshire finished iron is commanding a premium of £3 ($10.80). All foreign orders for pig iron are being refused, as some furnaces have been blown out and many others are operating with slackened blast due to a lack of coke. Scotch pig iron has advanced £1 ($3.60), while Scotch steel has gone up £2 ($7.20). Ferromanganese is quoted at 50 shillings ($180.00).

Imports of iron ore at the River Tees fell off 60 per cent in February. Neutral buyers are paying £11.10.0 ($41.40) for the Cleveland pig iron. As a result of the fall in the exchange rate, the German government is establishing a new department, which has been named Preissprufangstelle, to control export prices. Invoices must have the approval of the Preissprufangstelle before the issuance of an export license. There are some doubts as to the success of this maneuver, and the allies controlling the Rhine gateways look upon it unfavorably.

What little German steel is being exported is mostly going to Sweden in payment of an enormous debt for iron ore received from that country. German steel production now is at an annual rate of only 7,000,000 tons. Big premiums are being offered for early deliveries of plates, shapes and bars, making the prices 4000 to 5000 marks ($42 to $52.50) a ton. Even German buyers are paying half in foreign money to secure food credits.

European Staff Correspondence

Sterling—$3.40

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

BIRMINGHAM, Eng., Feb. 20.—Prices have been steadier this week, only minor changes having been made in pig iron. The attitude of the smelter is that price changes are immaterial, inasmuch as he is fully protected by an agreement which requires the buyer to pay the price current on delivery. At the Birmingham meeting sellers were only prepared to renew contracts on a restricted scale, refusing new business.

A remarkable feature of the market is the keen inquiry from Belgium for pig iron. One of the largest Derbyshire companies has been asked to ship 5000 tons of foundry iron and a Birmingham merchant has been advised that Belgium interests will take as much as 10,000 tons, but no British furnace could take the business.

In the Cleveland district there is a large demand for pig iron for export. Of the small quantities sent out the bulk is going to France and Belgium, but a consignment of 500 tons has gone to Sweden, and sales of foundry iron, hematite and ferromanganese have been made to Germany. The price to neutrals is a matter for negotiations, but is about £11.10.0 ($39.10), whereas France, Belgium and Italy can get Cleveland foundry iron at £9 ($30.60), as against £8.15.0 ($26.35), the selling price to home consumers. There is a general reluctance to sell hematite at present prices in view of the large increase in the best class of ores. The large increases in freight rates on foreign iron ores cause great anxiety. During the war the makers paid 17 shillings ($2.89) as their share of the ore charge, the government paying the remainder, but since the release from control, the freight from Bilbao to the Tees, has become £1.17.0 ($6.29), which brings the c.i.f. price on Rubio ore up to 70 shillings ($11.90) per ton.

The scarcity of semifinished steel has not been relieved. Sheet and tin bars in South Wales are selling at £29 ($98.60) to £30 ($102.00) per ton for special lots. The nominal figure however, is £25 ($85.00), which might be accepted on big running orders. The Midland rerolling mills continue in great difficulties, being unable to get sufficient material to keep them in operation. A few billets have been booked this week at prices ranging between £22 ($74.80) and £24

Current British Prices

Domestic and Export. Gross Tons at Works

	£ s d	$
SEMIFINISHED STEEL		
Billets, soft steel	25. 0.0	90.00
Sheet bars	30. 0.0	108.00
FINISHED STEEL		
Steel bars, England, ¾ to 3 inch	28.10.0	102.60
Ship plates, England	23.10.0	84.60
Ship plates, Scotland	23.10.0	84.60
Beams, England	21.10.0	77.40
Beams, Scotland	23.10.0	84.60
Sheets, black, 24 gage	40. 0.0	144.00
Sheets, galvanized, 24 gage	53. 0.0	190.80
Rails, 60 lbs. and over	19.15.0	71.10
Tin plate, base box, 108 lbs.	3.13.0	13.14
PIG IRON*		
Hematite, East Coast Mixed Numbers	11. 0.0	39.60
Hematite, Scotch	10.10.0	37.80
Middlesborough Basic	9. 5.0	33.30
Middlesborough No. 3	9. 0.0	32.40
No. 3 Foundry, Derby, Leicester, Nottingham	10. 5.0	36.90
No. 3 Foundry, Northamptonshire	9.17.6	35.55
No. 3 Foundry, Staffordshire	10.12.6	38.25
Scotch Foundry	11.10.0	41.40
Ferromanganese, 80 per cent.	32.10.0	117.00

*Pig iron quotations are f.o.b. furnace for delivery in the United Kingdom. Export prices generally are subject to free negotiation.

COKE		
Yorkshire furnace	2.13.6	9.54
Yorkshire foundry	3. 6.0	11.88

($81.60). At the Birmingham iron market Feb. 19 a rise of £3 ($10.20) per ton in steel strip and hoops was announced, bringing the selling figure up to £30.10.0 ($103.70). The finished iron manufacturers decided last week not to impose further increases on finished material, but it is stated that no sales are being made at the nominal figures, which are either profitless, or leave a very narrow margin. As the makers find consumers willing to pay an increase of £1 ($3.40) to £1.10.0 ($4.10) sales are generally on about that basis.

Raise French Pig Iron and Steel Bars

European Staff Correspondence

Value of Franc—$0.071

PARIS, Feb. 25.—Longwy pig iron has advanced from 380 to 400 francs ($26.98 to $28.40) to a higher spread of 405 and 425 francs ($28.75 to $31.17) a ton. Hematite pig remains at 520 to 540 francs ($36.92 to $38.34) but this price is only guaranteed until March 1, when it is due to advance 20 to 25 francs ($1.42 to $1.77).

Round steel bars have been advanced 20 francs ($1.42) per 100 kilos (220 pounds) to 170 francs ($12.07) while squares and hexagons have advanced 23 francs ($1.63) per 100 kilos to 193 francs ($13.70) and 106 to 150 francs ($7.52 to $10.65) respectively. Base quotations on tin plate from stocks remain the same, but the base prices are being exceeded by as much as 200 per cent in some cases. There are no stocks of French tin plate in the open market. One sale is reported at 225 francs ($15.97) per 100 kilos (220 pounds) as compared with the base of 150 francs ($10.65) for 180 pound boxes.

There is a shortage of 61 per cent of fine washed coke and 79 per cent of ordinary coke while the shortage of coal for forging plants is estimated at 61 per cent and steam coal at 52 per cent. These figures indicate the handicap which the metal industries of France are working under at this time. Foundry coke of French origin continues to be quoted at 140 francs ($9.94) at ovens and British, German and Belgian foundry coke, 180 francs ($12.78), French ports.

Possibility of a general strike in the various allied industries has by no means been averted as there are ugly rumors from the Lyons district in mid-France, and the great Hagondange plant, formerly Thyssen's, in Lorraine, is having more than superficial trouble at this moment.

The Syndicate of French Pig Iron Producers announces that production at present is far below the most pressing needs. This as much as anything must account for the rise in Longwy pig iron and the possibility of an equally heavy rise in hematite.

First Figures of French Output Issued

PARIS, Feb. 25.—The Comité des Forges de France has just issued statistics covering the production of iron and steel in France for the first six months of 1919. With the comments made concerning the situation they show more truly the exact rate of progress toward the reconstruction of the industry in France than anything yet presented since they represent the first complete statistics of their kind issued since the war.

Of the total of cast steel production of 1,004,518 metric tons, 988,962 tons were ingots and 15,756 were special castings. The production in 1913 reached a total of 4,686,866 tons, according to the same authority, thus showing an after-the-war production, based on yearly output, of something less than 50 per cent of the prewar figures. It must be considered, however, that the 1919 figures include those of the Lorraine plants previously accredited to Germany, so the figures given are not to be considered less favorable than they at first appear.

Finished steel production reached 655,868 metric tons. This was divided among various forms as follows:

	Tons
Rails, etc.	60,440
Wheels and rims	27,420
Beams	60,503
Profiles and machined steel	289,276
Plates and flats	124,640
Tin plate	14,562
Machine steel	34,349
Wire	6,816
Tubes	2,425
Forgings	19,681
Castings	15,756
Total	655,868

The production in metric tons among the different districts of France was distributed as follows:

	Quantity	Per cent
Eastern	130,524	13
Alsace-Lorraine	322,244	32.1
Northern	50,967	5
Center	283,246	28.3
South West	71,806	7.1
South East	48,103	4.8
Eastern	93,267	15.6
	1,004,518	100

Production of semifinished material amounted to 364,570 metric tons of blooms and 232,074 metric tons of billets. These were produced in the different districts as follows:

	Quantity	Per cent
West	98,563	9.7
Alsace-Lorraine	261,538	43.9
Northern	30,162	5
Center	114,142	19.2
South West	25,873	4.3
South East	25,475	4.3
Western	46,197	7.7
	596,644	100

The Loire district in mid-France where are centered the great plants of the Schneiders, Saint Chamond and their subsidiaries, may be considered the most prolific iron and steel producing region in France after that of the Lorraine and northeast districts. To a great extent the entire center and south of France depends upon this district for their provisioning. The Iron Operation and Steel commission of the Loire has just announced the following 1919 production figures, these with the output given in metric tons are as follows:

BLAST FURNACES

	No.	Output
In full operation	4	88,000
In part operation	1	28,000
Not in operation	8	.....

Shortage in 1919, as compared with full production, 68.1 per cent.

OPEN-HEARTH FURNACES

	No.	Output
In full operation	45	524,400
In part operation	13	168,400
Not in operation	32	.....

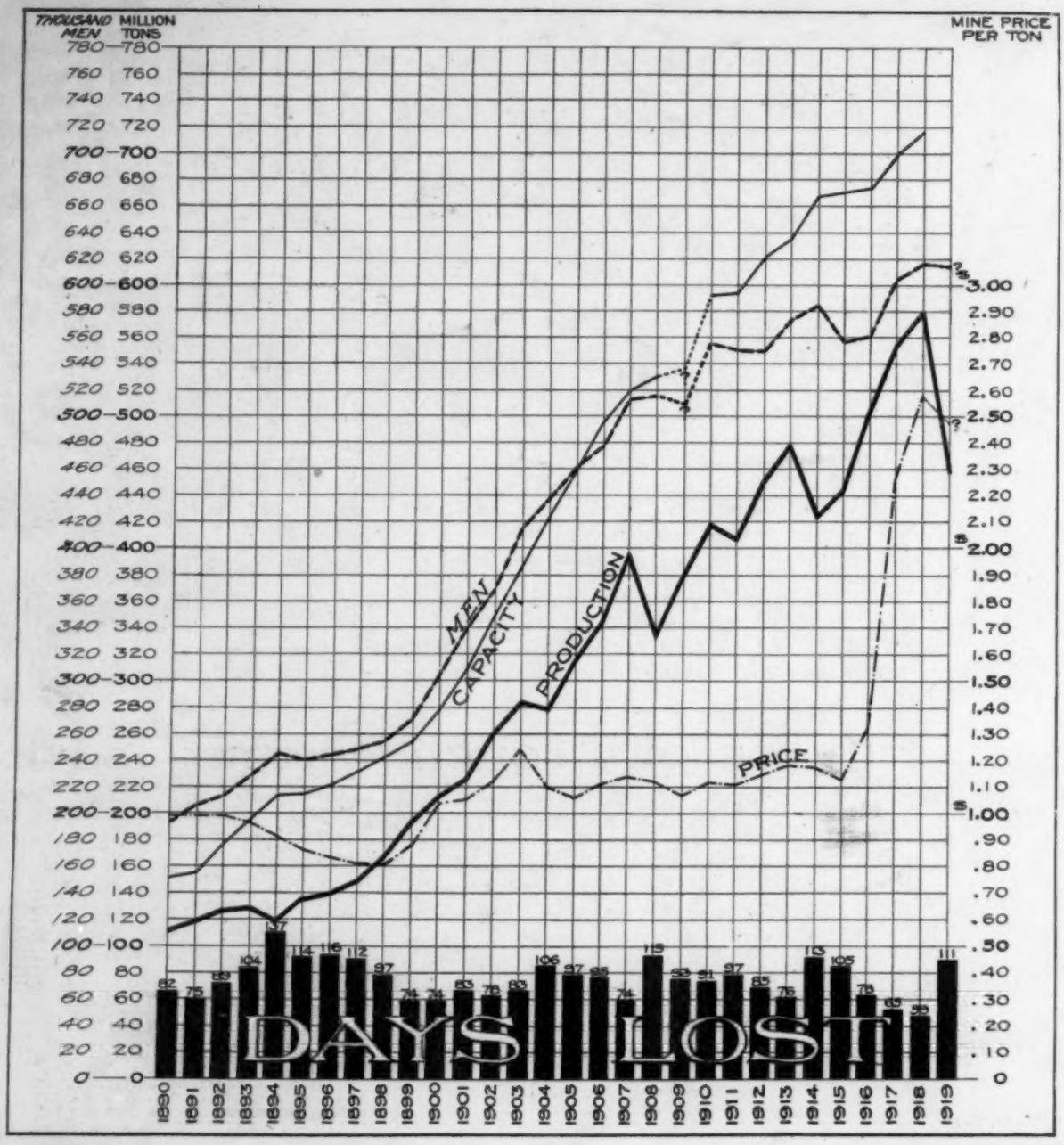
Shortage in 1919, as compared with full production, 67.8 per cent.

CRUCIBLE STEEL PLANTS

	No.	Output
In full operation	45	54,100
In part operation	13	14,080

Shortage in 1919, as compared with full operation, 73 per cent.

The consumption of coal in these plants which is largely procured nearby from mines in the center of France, showed a deficit of 58.2 per cent below that consumed in 1913 while the active steel production indicates a deficit as a whole of 68.4 per cent. Could more coal and coke have been had conditions undoubtedly would have been different.



Shows Trend of Coal Industry in 30 Years

FIG. 1—A number of interesting factors are revealed in the above chart prepared by the United States geological survey showing the production, capacity, number of men employed, mine price of coal per ton, and days lost at the bituminous coal mines of the United States during the 30-year period from 1890 to 1919, inclusive. It will be noticed that beginning in 1890 the production was about 110,000,000 tons per year, while the capacity of the mines at that time was approximately 150,000,000 tons. Generally speaking, each successive year finds the production and capacity curves farther apart until in 1918, which was the year of the greatest production the capacity was almost 720,000,000 tons. In other words, the capacity of the mines exceeded actual production in 1918 by about 140,000,000 tons, which is more than the entire annual output of 1890. This indicates very clearly that the soft coal mines of the country are equipped with labor and machinery far in excess of the normal need. The curve showing the number of men employed in the mines converges with the production curve, especially during the years beginning with 1907. This is indicative of greater productivity per man employed.

The black bars at the bottom, indicating the days lost per year, are significant. It will be noticed that the best year was 1918, the year of greatest production. When it is considered that these figures are based on the number of days lost in a total of 308 available working days per year, the intermittent character of the coal industry is at once apparent.

Solving the Soft Coal Problem

Statistics Covering 30 Years of Coal Mining Show Industry Suffers from Annual, Seasonal and Weekly Fluctuations—Excess Mine Equipment and Labor Supply Necessitated by Uneven Demand for Fuel

BY GEORGE OTIS SMITH AND F. G. TRYON

WHETHER we refer to full rated capacity or to average output, the operation of the soft coal mines of the country from year to year, from month to month, and from day to day presents a load factor that has been too wasteful of plant and labor and too productive of high costs and uncertain supply.

The fluctuations in coal production can be regarded as *annual*, which in a large way reflect nation-wide business conditions; as *seasonal*, which express conditions of market and distribution; and as *daily*, which express conditions of labor and car supply. In Fig. 1 the facts of coal production, labor supply, mine capacity and average return to the industry per ton produced, are set forth in curves for the 30-year period from 1890 to 1919. These statistics are weighted averages for a great industry spread over a large country and carried on under conditions that are widely divergent from place to place; these are the facts from the national point of view. Locally the conditions were far better or even worse.

Graphic Records Aid Coal Discussion

MUCH of the discussion on the subject of stabilizing the coal industry, which took place at the recent meeting of the American Institute of Mining and Metallurgical Engineers, was based on the information graphically shown by charts exhibited by George Otis Smith and F. G. Tryon of the United States geological survey. On account of the unusual significance of these charts a number of them are presented in the accompanying article, which is an abstract of the paper presented by Messrs. Smith and Tryon. The principal cause of present conditions in the coal industry is shown to be intermittency of operation, due to unevenly distributed demand.

In these graphs, the coal curve shows more frequent and greater fluctuation than the man curve. The general trend, however, of both these lines, representing coal output and labor employed, has been steeply upward, and the curves have fortunately converged, indicating the greater productivity of the average mine worker. The production curve definitely marks the years of general business depression, 1894, 1904, 1908, 1911 and 1914.

Mine capacity is seen to have kept well in advance of output, a relation in large part attributable to ever-increasing expenditures in mine equipment, which also largely account for the increase in average production per man from 579 tons in 1890 to 942 tons in 1918. That capacity curve,

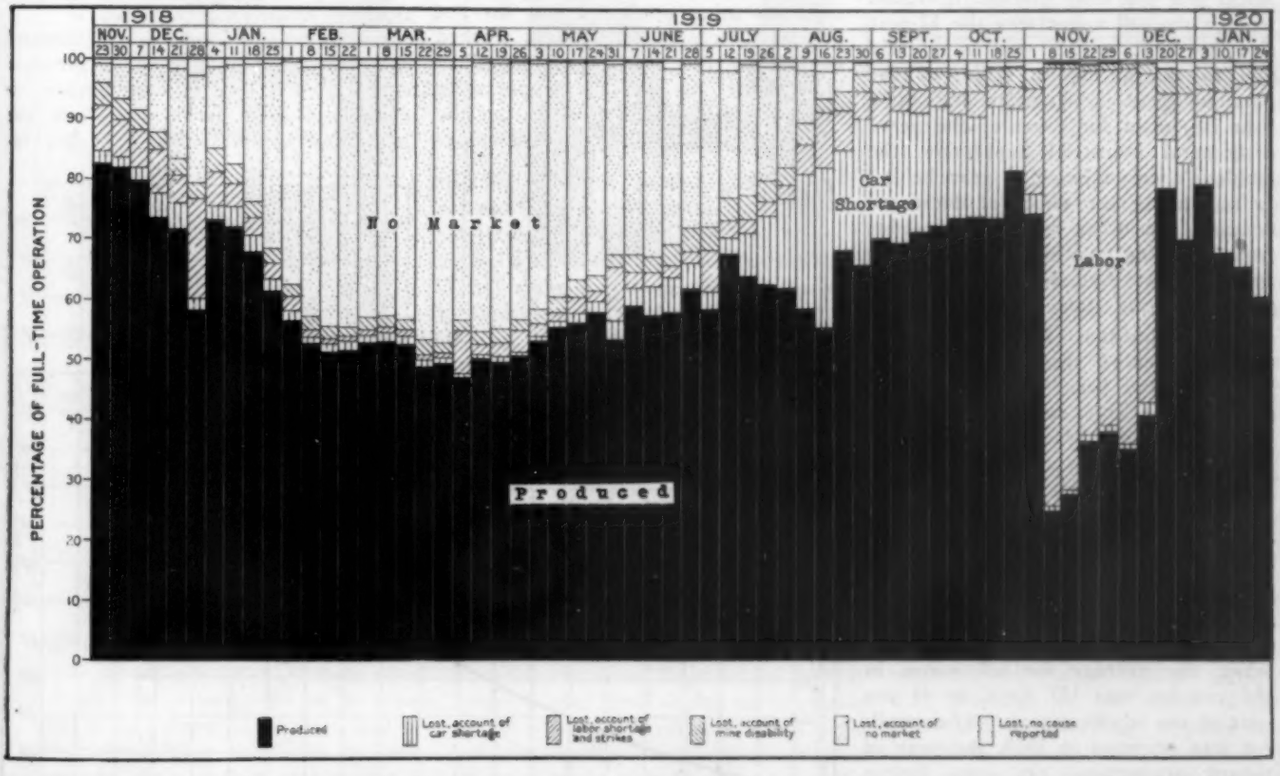


Fig. 2—Causes of Lost Time When Demand is Slack. Fluctuations in Production by Months Since the Date of Signing Armistice.

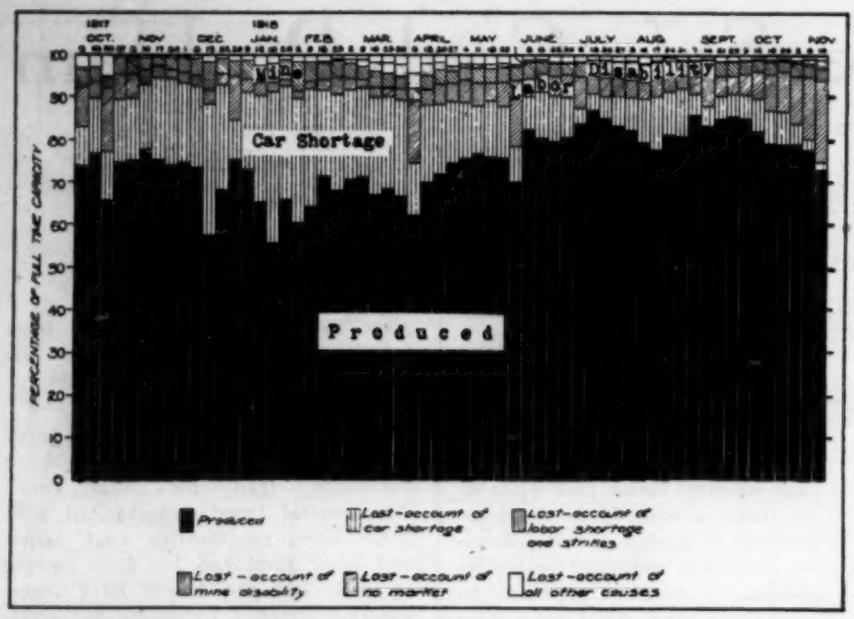


Fig. 3—Causes of Lost Time When Demand is Active. Fluctuations in Production by Months from October, 1917, to Armistice

so far above even the emergency output of the war period, suggests strongly that the industry has become overequipped and overmanned.

Price Curve Unaffected

The curve indicating average price f.o.b. mine seems to show relatively little influence by the other facts set forth in this diagram. Prior to the world war the only marked deviation from a smooth curve was the 12-cent rise in 1903, which was apparently due to the anthracite strike of the previous year. A similar lag of a year is shown for most of the years of general industrial depression, the employe's curve being a year behind in registering the effect of decreased demand. In other words, the exodus from the mine to other employment is not immediate but shows itself in the year following the short-time year.

Most significant for the purpose of the present discussion are the blocks at the base representing lost time in the soft coal industry. In only seven of these 30 years was such lost time less than 25 per cent of the working year. During the last 30 years, out of 308 possible working days a year, the bituminous mines of the country were idle on the average 93 days. Ten times during that period the time lost exceeded 100 working days. The greatest loss was in 1894 when the average for all mines in the country was 137 days, or 44 per cent of the working year. The smallest loss occurred in 1918, the year of record production, yet even during that year the mines were closed down for one cause or another for the equivalent of 59 days out of 308—nearly one-fifth of the time. These figures for lost time show only the days that the mines were not operated, and absenteeism of a part of the force when the mines were running still further reduced the output below that desirable maximum which would be profitable to miners and operators alike. That is, the figures of "average number of days worked and lost" refer to mine operation but do not necessarily represent the days worked or lost by the average miner. They show only the average opportunity offered to labor by the mines, not the extent to which the individual miner took advantage of his opportunity.

Returning to the consideration of the 30-year curves we may detect some discordance between production and capacity. The inevitable lag in time between development and active exploitation has a decided bearing upon working time. It means that during the initial period of a time of depression the disparity between production and capacity, which is the cause of poor working time, increases rather than diminishes. The diseased industry is thus carried by its own inertia into a condition which further aggravates the disease.

Fluctuations in 1913

The year 1913 may be accepted as a fair type of the odd year, when monthly fluctuations represent seasonal fluctuations in demand only, uninfluenced by labor disturbances. In such a typical year the capacity required during the month of maximum demand will be from 35 to 40 per cent greater than in the month of minimum demand. In other words, a mine capacity and a labor force sufficient for November, if working full time, would be employed in April only 70 to 75 per cent of the time; and as in actual practice the mines never attain 100 per cent or full time, even in November, but under the very best conditions reach only 80 per cent, the time of employment which may in fact be expected during April is about 58 per cent.

Even in years of active demand the present inequalities in the summer and winter buying of coal render inevitable a long period in which the labor and capital engaged in the in-

FIG. 4—Effect of irregular working upon costs. This curve, from the report of the engineers committee of the United States fuel administration is based on the monthly records of 73 operators in the New River district of West Virginia who produced 7,231,343 net tons of coal in 1917. This curve shows the extent to which the cost of coal increased when the number of cars available was diminished.

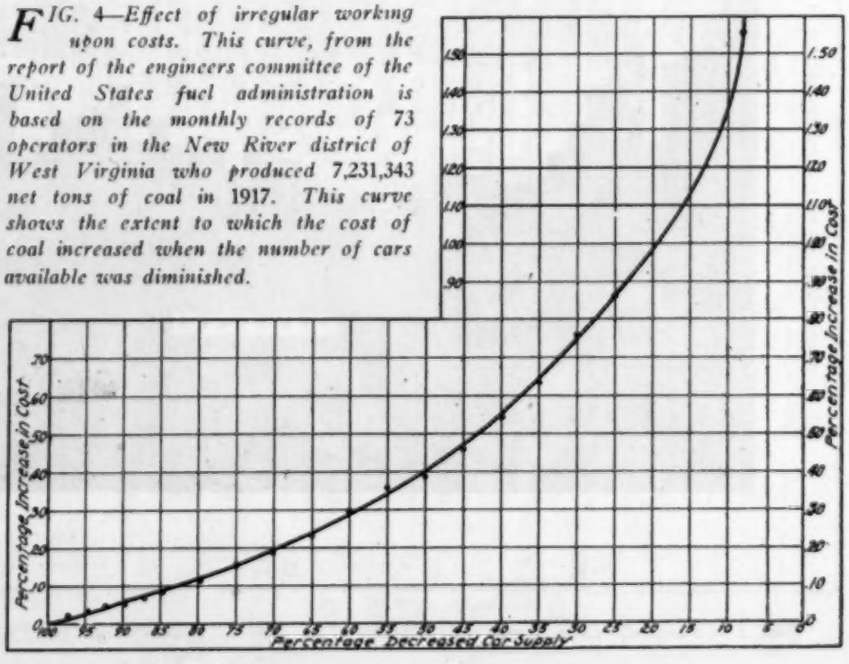
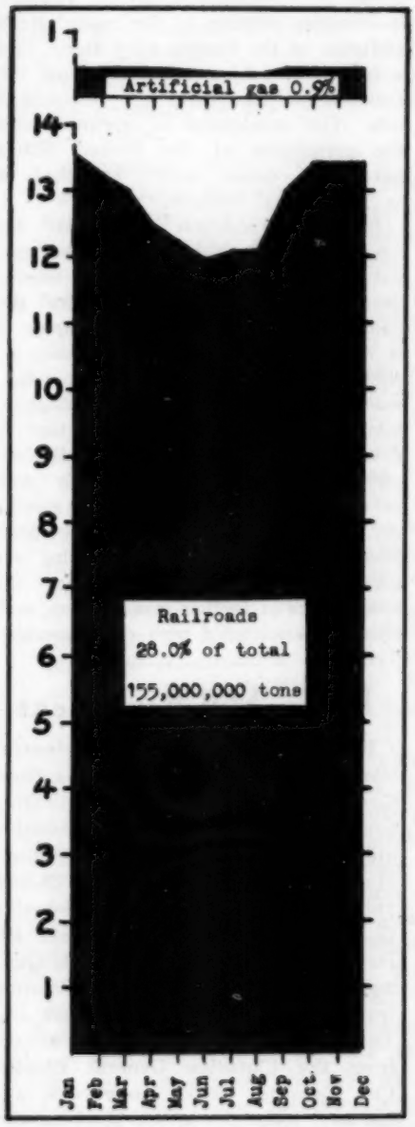
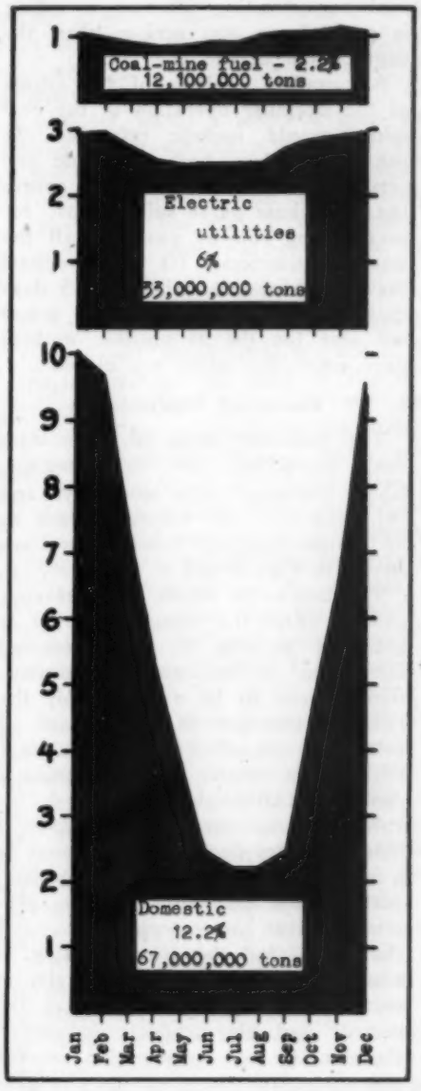
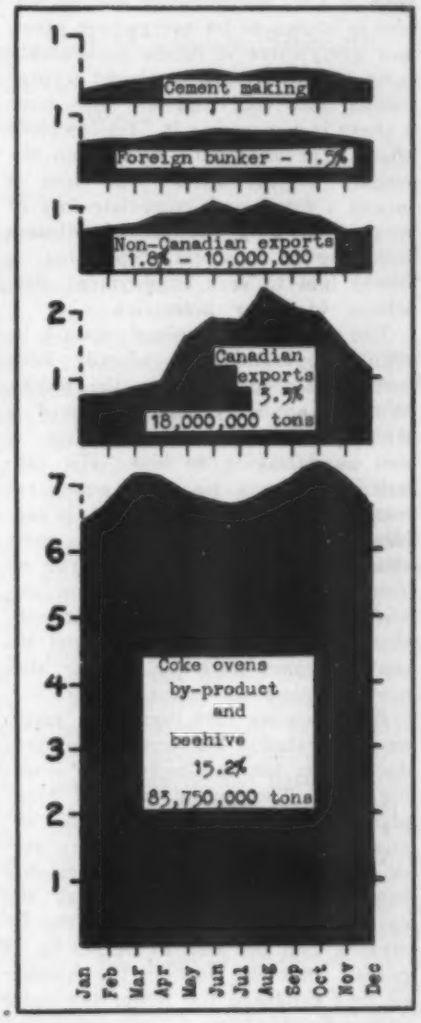


FIG 5—Seasonal fluctuations in the consumption of bituminous coal are shown in the accompanying diagrams. The railroads, consuming 28 per cent of the total output, use considerably less coal during the months of April, May, June, July, August and September than in the remaining months of the year. This also is true even to a greater extent in the case of domestic users of coal who purchase approximately 12.2 per cent of the annual output. The consumption of coal for artificial gas, by-product and beehive coke ovens, coal mines and electric utilities does not show as much variation from month to month as in the case of that used by the railroads and domestic trade. In the case of fuel used for cement making and exported the tonnage consumed in the summer months is greater than in the winter months, thus offsetting to some extent the lack of summer buying on the part of domestic consumers. The diagrams account for 72 per cent of the total consumption.







dustry cannot work more than 27 to 30 hours out of a 48-hour week. Let no one regard this as a condition to be accepted as the measure of working time necessary to meet demand. As a matter of fact the 30-hour week is the spring ailment of the bituminous coal industry, not its cure. In addition to the annual and seasonal fluctuations in production, there is a third set of fluctuations. The railroad works seven days a week; the mines work six days. Over Sunday the carrier catches up in its work of placing cars, and in consequence the car supply on Monday is by far the best of the week. As a result the miners work longest on Monday, but later in the week their hours of labor show a gradual decline, which is accentuated on Saturday by holiday absenteeism. Even if the mines should attain full time on Monday they could not under the circumstances expect to work more than 86 per cent of the time on Friday and 79 per cent on Saturday. But of course the Monday rate never in practice gets up to 100 per cent, and the performance on the later days of the week is correspondingly defective.

During the seven years from 1913 to 1919, inclusive, each of the bituminous regions has lost more time than the anthracite country. By regions the 7-year average has been as follows, arranged in order of time idle:

Region	Days worked	Days idle
Anthracite	260	48
Southern Appalachian	248	60
Northern Appalachian	247	61
Southern Rocky Mountain	242	66
Middle Appalachian	225	83
Northwestern	223	85
Iowa to Texas	204	104
Central competitive field	199	109

It is perhaps significant that there is a rough relation between the loss of working time and the degree of unionization. Those bituminous regions in which interruptions to operation are most pronounced show a tendency to become union territory. The presence of the union is both cause and effect. Wage disputes cause lost time; but, on the other hand, irregular employment is in itself a prime incentive to unionization.

The fact of irregularity in working

time is thus indisputable, and its extent is shown to be everywhere great, and everywhere it reacts unfavorably upon all who have a share in producing soft coal and all who have a share in consuming it. Its injurious effect is perhaps most evident on the welfare of the miner. To him it means a direct and immediate loss of wages. In long periods of idleness following a business depression it drives him to seek employment elsewhere, in other industries.

The case of the miner against irregular operation has already been forcibly set forth before the public. What is not so generally realized is that the case of the operator is just as damaging to him. His capital is idle, and his mine equipment instead of benefiting by a rest, is rapidly depreciating. Although the mine shuts down, his fixed charges run on —not only interest charges and salaries, but a host of maintenance charges as well. And in the end the coal consumer pays the bill for idleness of miner and mine.

Fig. 4 shows that there is a mathematical relation between cost of production per ton and decrease in working time. The special cause of irregular working time selected for analysis was car shortage, but any other cause of loss would presumably have affected in the same way the cost per ton. The reason for the increased cost per unit of output is, of course, that the smaller the number of tons produced the larger the share of the fixed overhead expenses which must be borne by each ton. Francis S. Peabody, testifying before the Frelinghuysen committee on Sept. 4, 1919, stated that "the earnings of the laborer and the cost of coal depend entirely upon continuous work. Our costs will vary from month to month, depending upon the running time of our mines. There will be a variation of between 50 and 60 cents a ton from month to month, depending upon the number of hours mines are idle."

The effects of fluctuation in coal production on our transportation system can readily be appreciated. The coal mine is the railroad's largest shipper, and the railroad in turn is the largest consumer of coal; in fact it has been remarked that coal is the nucleus around which our railroad system is built.

When the operator is up against a car shortage he is prone to blame the railroad for what he regards as a failure to meet its obligations. He does not realize, perhaps, that the railroad suffers from the seasonal fluctuations in coal production as well as the coal-mining industry, for in its business of selling transportation to the coal producer the railroad meets the same seasonal demand that the producer meets in selling coal to the retailer. An investment in coal-carrying equipment sufficient to transport all the coal that the mines can produce in November would in large part lie idle during the slack season of summer. The depreciation of a coal car standing idle on a siding is perhaps no less serious than the depreciation of the idle mine.

A complete analysis of the effects of the irregular operation of the coal mines would include references to the coal dealers, both wholesale and retail, but the consumer is of course the one whose purse suffers most, for in the long run he pays for all the wasteful practices. He must support the miner for not only the 215 days that coal is coming from the mines but also for the 93 possible working days when the mines are closed.

Causes of Fluctuations

The immediate cause of these seasonal fluctuations are car shortage, labor shortage, mine disability, and "no market." The varying values to be assigned to all these causes are shown in Figs. 2 and 3.

The degree to which different consumers affect the seasonal market is indicated in Fig. 5. The seasonal fluctuation in locomotive consumption is seen to be a factor, for the railroads consume 28 per cent of all soft coal mined. An even larger offender in degree is the domestic consumer, although the amount involved is much smaller. The general industrial user doubtless ranks next as a contributor to the seasonal fluctuations, but the public utilities present a much more even curve, and the curve for the iron industry is somewhat the same. Fortunately, in certain other industries, such as the cement and clay-products industries, the summer coal consumption exceeds the winter and the effect on the general production is beneficial. Export and bunker trade and the lake shipments likewise tend to smooth out the seasonal curve.

The line of attack for the betterment of seasonal demand therefore seems to be narrowed down to a few classes of consumers. The problem of improving the load factor for the coal mines thus becomes a problem of encouraging the summer buying of coal. Two methods of solving this problem have been suggested: Seasonal discounts of the coal prices and seasonal freight rates.

The general interest of our whole nation in bettering the load factor of the soft coal industry is large. Irregular employment is both a loss in manpower and a cause of social unrest. Society cannot view with equanimity the spectacle of an excess mine capacity of 150,000,000 to 200,000,000 tons, and an excess labor force of perhaps 150,000,000 men.

Book Review

Manufacture and Uses of Alloy Steels, by Henry D. Hibbard; cloth; 96 pages, 5½ x 9 inches; published by John Wiley & Sons, Inc.; furnished by THE IRON TRADE REVIEW for $1.25 net.

With the purpose of stimulating the demand for alloy steels and extending their practical use, the author has prepared this monograph giving valuable information relating to the manufacture and uses of the various alloy steels. As a result, the subject is treated from the practical rather than the theoretical side. The monograph is reprinted with the permission of the United States bureau of mines, which published it as a technical bulletin.

In the introduction the author defines the terms which are used throughout and tends to eliminate the misunderstanding arising in confusing the names of different steels. Chapter I is devoted to a list of alloy steels, including a general discussion of the uses, manufacture and properties of these alloys. The remainder of the text is devoted to discussion of the individual steels, each variety being dealt with in a separate chapter. In the specific discussions such subjects as composition, heat treatment and results are given careful consideration. For the convenience of further investigation, each chapter is concluded with a bibliography.

Places Mill Equipment

Equipment ordered for the extensions of the mill of the Algoma Steel Corp., Ltd., Sault Ste. Marie, Ont., consists of 35 and 40-inch blooming mills, purchased from the Mesta Machine Co., Pittsburgh; 28-inch finishing mill, Morgan Engineering Co. Alliance, O., cranes from the Dominion Bridge Co., Montreal, Que.; main mill and direct current motors from the Canadian Westinghouse Co., Toronto; alternating current motors from the Canadian General Electric Co., Toronto; tables, conveyors, and hot bed, from the Mesta Machine Co., M. H. Treadwell Co., Easton, Pa., and the Turner, Fricke Mfg, Co.,Pittsburgh; reheating furnaces and soaking pits from Alex Laughlin & Co., Pittsburgh. Structural steel for building and runways has been awarded to the Hamilton Bridge Works Co., Hamilton, Ont.

Specifying Steel for Automobiles

Demands of This Trade Involve Steels of Minimum Weight and Maximum Strength —Carbon Steels Are Undependable When Subjected to Alternating or Fluctuating Stresses—Alloys Used for Special Work

BY LESLIE AITCHISON

NEED for comparatively high strengths is the feature which distinguishes automobile steels most sharply from other engineering steels. To automobile engineers, weight is of great importance and saving of weight can only be accomplished successfully by gaining in strength. This means, in general, that they are primarily interested in alloy steels since plain carbon steels cannot be relied upon to give the same high strengths as are obtained from alloy steels.

Automobile steels require in as great a degree as possible the fundamental properties of high strength, high toughness, great durability, soundness, ease of machining, ease of heat treatment, constancy of properties and homogeneity of properties. Other properties enter in when steels for special purposes are being considered but the properties just mentioned apply to practically every steel which will be used.

High strength means that the steel shall be able to withstand a high stress. If the part is subjected only to a plain static load the high strength may be taken to mean a high value of the elastic limit. If, however, as is usually the case in an automobile, the steel is subjected to alternating or fluctuating stresses, the high strength means a high fatigue strength.

High toughness is a very difficult property to measure, but for most purposes it probably will suffice if the impact or notched bar test be taken as the means of deciding the toughness. Impact values are not absolute values like maximum stresses but are relative and must always be considered along with the tensile strength associated with them. This quality of a steel is usually either good or bad with few intermediate values. If the value given is anything like the specified value the steel is good. If the steel is brittle the value is quite low.

Great durability is an expression which seems to describe adequately the property often described as hardness. The word hardness has been avoided purposely because there is no known measure of hardness. The engineer wants a steel to wear well and to be durable when acted upon by wearing forces. This property is usually associated with case hardening steels and the only true criterion is a file test, which is not a good one.

Must Be Machined Easily

Soundness is the term taken to cover all these defects which are associated in the mind of the engineer with the follies of the steelmaker. They cannot be expressed in simple scientific terms. Some steels are more prone to contain these defects than others. Ease of machining is of great importance in automobile steels since without this property the engineer has no use for a steel. It is not necessary, however, that the steel shall be machinable in all its physical conditions. It is sufficient that it shall be capable of being so heat-treated that it can be machined with comparative ease. A steel of high tensile strength if tempered down can be machined easily and may be subsequently hardened again.

Ease of heat treating is essential in automobile steels. By this property it is intended to mean that the treatment required by the steel is not only simple but is regular, that is, that two successive batches of the same steel require more or less the same treatment. It may be objected that heat treatment is a thing to be avoided, or that it is best to use automobile steels in the nonheat treated condition. This opinion is mistaken, because in both carbon and alloy steels heat treatment alone can produce that structure or constitution which accompanies the high strength and high toughness which are required by the engineer. If two steels are available for an engine part, one of which has been hardened and tempered and the other not heat treated to give the same strength, the hardened and tempered one should always be used particularly for the parts appreciably stressed. In the heat treated steels the structure is more or less homogeneous, being partially decomposed martensite in most cases, and this structure combines toughness and strength to a greater degree than any other.

Constancy of properties is tested easily. By this property is meant that two successive batches of the same class of steel are of almost identical properties. This depends mainly upon the use of a constant chemical composition, but it means also that the composition shall be a suitable one for the properties required and not a freak one. In other words, it is a composition that will give the required mechanical properties with ease and not merely occasionally.

Homogeneity of properties means that the steel shall have practically the same properties in the middle and the outside of the part, or that the steel shall not suffer unduly from mass effect. This involves the proper selection of chemical analysis and practically nothing else.

Steels may be divided into four groups for conveniently applying tests for the required properties for automobile use; namely, case hardening, plain carbon, alloy and special steels. Case hardening steels are used a great deal in automobile work, and their specific mission is to supply a hard case. To the engineer this is of primary importance, and no other consideration can weigh in the judging of a case hardening steel if this property of hardness of the case is not forthcoming. Judged from this point of view, which is after all the only correct one, the plain carbon steels cannot be excelled. No other steel gives such a hard case as the plain carbon steel, although it must be admitted that some of the alloy steels come fairly near to it. Many alloy case hardening steels contain either nickel or nickel and chromium.

The engineer is also concerned with the strength and general properties of the case. The main function of the case hardening steels is to be hard and the properties of the core have little or no influence upon the hardness of the case. Nevertheless, the engineer may be justified in preferring to use a steel with a strong core

From a paper presented at the recent meeting of the Birmingham Metallurgical society, Wolverhampton, England.

rather than a weak one, provided that the case on such a steel is adequately hard. Whether this preference is justifiable on the part of the engineer has been debated frequently, there being no question but that the strong core is better for the engineer's purposes. This being so, the properties of the core deserve some attention. Table I shows the ordinary properties of the steel as revealed by a tensile test. Table II indicates the fatigue range of the core of the case hardening steels, which is of great importance. Table III gives some interesting figures showing the strength of the case hardened beams made from different case hardening steels.

Regarding soundness there is little choice among the case hardening steels insofar as the effect of varying composition is concerned, because the low carbon, which is or should be present in every one, makes them somewhat similar from a steelmaking point of view. Much difference exists among the steels regarding seaminess due to the presence within the steel of an extra large proportion of slag. Slag is a nuisance in any steel but in case hardening steels it is almost intolerable, since case hardening surfaces are often subjected to abrasion and heavy wear. If a slag streak or the resultant seam is present on a surface, trouble is almost bound to follow.

Ease of machining is a matter which does not seriously arise in connection with case hardening steels, since before they are hardened all these steels are quite easy to machine. Homogeneity of properties is practically never met with in case hardening steels. This type of steel is particularly prone to suffer from mass effect in hardening. The variation in properties is very great, particularly in the stronger classes of steel.

Case hardening steels are not to be recommended for constancy in properties. In consequence of the low proportion of carbon in all of the steels, a difference of 0.02 per cent of carbon, which occurs in the best of steelmaking practice, means a distinct difference in the physical properties of the steel. When dealing with case hardening steels, it is advisable to make calculations upon the minimum percentage of carbon.

Carbon Steel Strength Limited

Properties of the plain carbon steel are better known than those of the alloy steels, and in addition, the carbon steels are used in the less strenuous parts of the machine. Plain carbon steels are rarely expected to give a tensile strength of more than 89,600 pounds per square inch and this property can be met by a steel of about 0.35 to 0.40 per cent of carbon normalized, or 0.30 per cent of carbon if cold drawn. These facts have automatically led to confining most automobile plain carbon steels to the above maximum of tensile strength. Perhaps this is just as well, since if higher strengths be attempted from the carbon steels, a serious loss of toughness frequently results. Even assuming the above limits it would be well to specify the steel requirements more precisely, and to limit the compositions in a definite manner.

With a view to producing the most satisfactory combination of strength and toughness, the carbon steels well repay heat treatment. A 0.45 per cent carbon steel heated to 850 degrees Cent. and water quenched to a temperature of 600 degrees Cent. showed a yield point of 78,400 pounds per square inch, a maximum stress of 112,000 pounds per square inch, an elongation of 24 per cent and an impact of 49 foot pounds while the same steel heated to 850 degrees Cent. and water quenched to 700 degrees Cent. although showing a yield point of 67,200 pounds per square inch, a maximum stress of 96,300 pounds per square inch, and an elongation of 29 per cent, showed an impact of 64 foot pounds. These results show that although there may be no great difference in the strength, yet there is a vast difference in the toughness of the nonheat treated and heat treated steels.

Normalizing carbon steels after forging or rolling is desirable. Carbon steel is always better and safer if it is normalized and this operation should never be omitted from the treatment given to plain carbon steels unless they are to be hardened and tempered. The fatigue range of typical steels, which for automobile purposes is of prime importance, has indicated by test that the fatigue range is related closely to the maximum stress of the steel, rather than to the elastic limit, being approximately equal to the maximum stress. This class of steel is not expected to have any great durability.

Plain carbon steels are not very easy to heat treat. In this respect they are very inferior to the alloy steels when definite mechanical properties as a result of the heat treatment are expected. This is partly due to the fact that pure carbon martensite is decomposed with comparative ease, and hence the quenching, which will prevent even a partial decomposition of the martensite, has to be done very efficiently and drastically in order to produce satisfactory results. The same fact makes the plain carbon steels very prone to mechanical nonhomogeneity when quenched in large masses.

Mass Has Effect Upon Strength

Many of the alloy steels will give any maximum stress between 112,000 and 224,000 pounds per square inch, but they do not all do this with the same ease. It should also be said that the mass of the part enters very largely into the choice of an alloy steel to give any particular strength. Consequently, the property of these steels will be discussed as suitable for parts of both large and small mass. By large mass, parts over 3 inches diameter are meant, and by small mass, parts about 1½ inches diameter are indicated.

The results given by steel with a tensile strength of from 168,000 to 224,000 pounds per square inch depend upon the mass of the part. If the part is of any great size, steel with a tensile strength above 100 tons per square inch should be used. This lower strength steel can be tempered satisfactorily and will give a good range of mechanical properties. Oil hardened at 820 degrees Cent. and tempered to various temperatures, the results are as follows:

Quenched to degrees Cent.	Maximum stress pounds per square inch	Elongation per cent	Impact foot pounds
...	253,200	12	19
400	206,000	15	16
500	174,700	16	31
600	138,900	21	58

Evidently any required strength in the desired range can be met by the proper tempering of the above steel. For small parts the requisite strength can be obtained by the use of steel which requires to be hardened in oil and at the same time a fairly good toughness value can be registered. There are many such steels but one of the best has the following composition:

	Per cent
Carbon	0.3 to 0.36
Nickel	3.0 to 3.75
Chromium	0.6 to 0.90

After oil hardening at 830 degrees Cent. and tempering, this steel has the mechanical properties which are shown in the following table:

Quenched to degrees Cent.	Maximum stress pounds per square inch	Elongation per cent	Impact foot pounds
...	248,800	14	10
400	188,100	15	9
500	161,300	18	31
600	141,000	22	52
650	127,800	25	64

Machining of all steels which are finally to have a strength of over

168,000 pounds per square inch should be done before the final hardening has been effected, as otherwise they will be practically unmachineable. The steels, therefore, should be specially softened for machining. This is another argument in favor of the use of the air hardening as with a steel a smaller finishing or grinding allowance is required than with the oil hardening steel in consequence of the reduced distortion.

Steel of 134,400 to 168,000 pounds tensile strength has the advantage that it is machineable after the final heat treatment has been carried out. Many steels can be used to give the strength and of course either of the two already described can be utilized satisfactorily. There is no point, however, in using an air hardening steel for parts of this strength, but no better steel can be employed than the oil hardening steel just discussed. If the parts are of quite small mass a steel containing less nickel can be used though in general the heat treatment of such a steel is not quite so simple as that of the steel with the higher nickel. Such low nickel steel has approximately the following composition:

	Per cent
Carbon	0.30 to 0.40
Nickel	1.20 to 1.70
Chromium	1.00 to 1.50

The mechanical properties after oil hardening at 850 degrees Cent. and the influence of varying mass upon mechanical properties are as follows:

Quenched to degrees Cent.	Size of bar diameter in inches	Maximum stress pounds per square inch	Elongation per cent	Impact foot pounds
...	1¼	275,800	3	2
500	1½	167,900	9	12
600	1⅝	129,900	22	55
650	1⅞	123,100	25	73
650	3¼	125,300	23	63
650	2¼	127,800	20	64
650	3½	145,500	17	69

For the range of strengths of 112,000 to 134,400 pounds per square inch, a large variety of steels are available and three of them deserve mention. The first is a lower carbon variety of the 168,000 to 224,000-pound class and has the following composition:

	Per cent
Carbon	0.26 to 0.33
Nickel	3.00 to 3.75
Chromium	0.60 to 0.90

The second steel is the one with the low nickel as described in the 134,400 to 168,000-pound class and the third is a chromium or chromium vanadium steel with the typical composition:

	Per cent
Carbon	0.35 to 0.45
Chromium	1.00 to 1.50
Vanadium not more than	0.25

Properties of this steel after it has been heated to 850 degrees Cent. and oil quenched to 525 degrees Cent. were a yield point of 103,000 pounds per square inch, a maximum stress of 125,400 pounds per square inch, an elongation of 19 per cent, a reduction in area of 52 per cent and an impact of 45-foot pounds. Any of the three steels given can be used, but if the part is one of large mass, the first steel will be found to give the best results.

Some Steels Give Low Strengths

Practically none of the nickel chromium steels can be treated to give such a low strength as is called for by the steel of 89,600 to 112,000 pounds per square inch tensile strength. The mechanical properties required can be obtained satisfactorily, however, from either a chromium vanadium steel or a straight nickel steel. If the former class of steel is employed, the carbon should not be quite so high as suggested in the previous class but should be approximately as follows:

	Per cent
Carbon	0.30 to 0.40
Chromium	1.00 to 1.50
Vanadium not more than	0.25

A suitable composition to specify for the straight nickel steel would be as follows:

	Per cent
Carbon	0.25 to 0.35
Nickel	2.75 to 3.50

After heating to 860 degrees Cent. and oil quenched to the various temperatures the mechanical properties are as follows:

Quenched to degrees Cent.	Maximum stress pounds per square inch	Elongation per cent	Impact foot pounds
...	246,100	9	8
400	172,400	14	8
500	138,900	21	48
500	121,000	25	69
650	109,800	26	78

Alloy steels will give the requirements of the engineer regarding high strength quite completely and they will give, provided they are properly heated, the highest available toughness. It is necessary, however, for the production of this combination of high strength and high toughness that the heat treatment be properly conducted. The maximum toughness is obtained from a steel when the maximum strength required has been produced in the steel with the greatest ease. This means that if a steel is air hardening it is likely to be tougher after hardening to any particular strength than is steel which must be hardened in oil or water to give the same strength. If a high strength is required, a steel should be used which will give the strength without drastic hardening. Good results do not follow from the forcing up of a steel to give high strengths by quenching in water or oil. The steel is sure to be low in toughness and the mass effect is certain to become evident unless the parts are exceedingly small and of uniform dimensions.

If the lubrication is good, almost any steel which is sufficiently strong to stand up to the actual loads imposed upon it will do the work, but if the lubrication is bad, it is doubtful whether any steel of whatever hardness will do the work. Durability of steel is not necessarily controlled by its tensile strength or, in other words, its Brinell hardness. The author believes that the air hardening steels will give better durability properties than oil hardening steels of the same strength.

Soundness of alloy steels is rarely as good as that of the plain carbon steels although the straight nickel steels offer little difficulty. Generally speaking, the soundness of the alloy steels is inversely proportional to the tensile strength which they possess after cooling in air. Up to about 141,100 pounds per square inch, it is found that the steels do machine with tolerable ease, the ease being inversely proportional to their strengths. Fortunately all alloy steels can be softened down to some strength less than 141,120 pounds per square inch, and the machinist should insist upon receiving his materials in that condition. The steels can be treated properly afterwards, and a small finishing allowance left upon the part to get rid of the change of dimensions due to distortion and also slight scaling produced during heat treatment.

Ease of heat treatment is pre-eminently a property of the alloy steels, provided always that the rule given above be observed, namely, that the steel chosen to do the job shall do it easily and not with difficulty. The air hardening steels are very easy to treat and the rest of the steels should give the required strength easily by quenching in oil. As the steels are almost always used after hardening and tempering the desired strengths can be obtained by suitable variations in the latter process which is very flexible. It should be mentioned that the nickel chromium steels should always be quenched in water after tempering in order to insure the production of the highest toughness. Alloy steels arranged in order as to the ease of heat treatment are as follows: 224,000-pound hardening nickel chromium steel, high nickel nickel chromium steel, straight nickel steel, low nickel steel, low nickel nickel chromium steel, and chromium vanadium steel.

Alloy steels lend themselves to ease of production of properties, provided that the chemical composition be controlled within suitable limits. The chemical composition chosen should be one which allows the desired mechanical properties to be obtained with ease.

If these two points are attended to, the requisite mechanical properties can be obtained with clockwork precision. Homogeneity of properties can only be obtained with the alloy steels; however, to obtain this property, it is essential that the steel be one which will harden easily. In some particular parts of an engine, for instance the valves, the duty imposed upon the steel is special and severe and calls for the use of unusual material. Valve steels can be classified as follows: Inlet valves of all engines; exhaust valves of cool engines with running temperature of not more than 600 degrees Cent; exhaust valves of medium hot engines with running temperature of valve 600 to 750 degrees Cent; and exhaust valves of hot engines with running temperature of valve more than 750 degrees Cent. The following four steels will probably be found to give the most satisfactory mass for these four classes of duty respectively: 3 per cent nickel steel; 3 per cent nickel steel, high chromium steel, and high tungsten steel.

Table I

Properties of Steel Revealed By Tensile Test

Steel	Yield point pounds per square inch	Ultimate strength pounds per square inch	Elongation per cent	Reduction of area per cent
Plain carbon	62,700	80,700	20	55
High nickel chrome	123,200	145,800	12	35
3 per cent nickel	80,700	100,800	15	45
5 per cent nickel	94,200	134,300	12	40
6 per cent nickel	89,600	123,200	14	40

Table II

Fatigue Range of Core of Case Hardening Steel

Steel	Elastic limit pounds per square inch	Ultimate strength pounds per square inch	Fatigue range pounds per square inch
Plain carbon	34,300	85,200	41,500
3 per cent nickel	40,400	148,100	69,500
5 per cent nickel	35,800	141,300	67,300
6 per cent nickel	44,800	115,800	59,500

Table III

Strength of Case Hardened Steel Beams

Steel	Skin stress (tension) pounds per square inch at which case cracked	Yield point (tension) of core pounds per square inch	Maximum stress (tension) of core pounds per square inch
Plain carbon	144,100	54,000	90,400
3 per cent nickel	208,000	89,600	148,200
5 per cent nickel	214,000	112,000	141,300

Valve springs are parts which usually receive special attention. The steels generally employed for this are plain high carbon steel and chromium vanadium steel. The composition of the former is usually 0.8 to 1.1 per cent carbon and 0.35 to 0.6 per cent manganese and of the latter 0.4 to 0.5 per cent carbon, 1.1 to 1.5 per cent chromium, not more than 0.25 per cent vanadium and 0.4 to 0.7 per cent manganese. There seems to be no particular reason for the exclusive use of these two steels as any other steel which would give the same physical properties would do as well. The importance of getting away from the idea that there is any particular virtue in spring steel as such is very great and it is time an effort were being made to utilize other and probably cheaper steels for this work. The steels employed do not possess any noteworthy ease in hardening and it would be distinctly advantageous to use a steel which does possess this ease of hardening. The Germans have used steels other than those already mentioned with great success. Ball bearings are usually made from one or two classes of steel. Many bearings are made from case hardening steels of different types while other bearings are made from what is termed as a direct hardening steel, or in other words, an alloy steel that hardens through. The steel most often employed is a high carbon chromium steel of the following approximate composition: Carbon 0.9 to 1.1 per cent; chromium 1.3 to 1.7 per cent; and manganese 0.4 to 0.6 per cent. This steel can be hardened very thoroughly by quenching in oil and after this treatment gives a Brinell hardness number of nearly 600. It is suitable for most bearings.

Make Shells in Navy Ordnance Plant

ON THURSDAY, Feb. 19, at Indian Head, Md., the third of the first five 16-inch projectiles manufactured at the naval ordnance plant, South Charleston, W. Va., successfully met the requirements of the government, piercing a target of 13-inch armor plate. According to Capt. George R. Marvell, inspector of ordnance in charge of the plant, the projectile shop in the West Virginia plant is about to begin operation on a production basis. It is said that the 16-inch projectiles now can be turned out at the rate of 20 per day. The plant already is producing rough forgings for naval guns.

The projectile shop, or north unit of the ordnance plant, has been completed. Construction work on this unit was started in the fall of 1917, and the remainder of the year was spent on grading, excavating and erection of column foundations. By Feb. 1, 1918, work on the buildings had been well started and a few items of equipment were on the ground. Practically all the major items had been contracted for and the inspector of ordnance in charge was ordered to duty. The work of organizing the various departments and acquiring a working force went ahead as rapidly as the various contracts warranted, and by Oct. 19, 1918, the force was built up to about 715. In June, 1919, the force was approximately 2200, including men employed on construction work.

Details regarding the equipment of the projectile shop are contained in an article appearing in the Feb. 23 issue of the *Charleston Daily Mail*. A writer in that paper states that the plant consists of a forge and foundry building, 135 x 565 feet, a heat treatment building 105 x 156 feet, a machine shop 140 x 404 feet, locker and lavatory building 75 x 112 feet, and an administration building.

Melt shop No. 1 is equipped with three 6-ton heroult electric furnaces. The east end of the building contains two 60-inch cupolas and a molding floor. Operations in the ordnance plant began with the heat poured from the first electric furnace on June 6, 1918. All furnaces were in operation by Aug. 18, 1918, and production rapidly increased from that time. When the first heat was poured only two men carried on the melt shop roll, W. H. White, present superintendent of melt shops, and J. E. Arthur, foreman of melt shop No. 1, had ever seen molten steel before.

Today the melt shop is running three

shifts under the supervision of trained melters. All three furnaces are tapped into one ladle and 18-ton alloy steel ingots for 6-inch jacket forgings are cast.

Forge shop No. 1 is located in the west end of the forge and foundry building. The equipment consists of one 3000-ton press, one 500-ton press, 11 forge furnaces and five car-bottom annealing furnaces. All of these furnaces use natural gas for fuel. The forging operations began on July 6, 1918, when the first forging was brought under a hammer and work started on a job order for 20 5-inch mushrooms. The 3000-ton press is operated by four hydraulic pumps and a hydraulic intensifier.

This press was received in several shipments and was finally erected by the plant force and put into operation Oct. 20, 1918. At present both forge presses are operating near capacity and work for 6-inch liners, tubes, and jackets, and 16-inch counter recoil cylinders is being done in this department.

Heat treatment shop No. 1 is adjacent to and just to the south of the forge and foundry building and connected thereto by a transfer track. The equipment consists of four special double furnaces for the heat treatment of projectiles and miscellaneous small forgings, and two continuous shell treating furnaces. Two vertical gas-fired, semimuffle furnaces are in process of construction. There are at present three quenching tanks and a vertical spray soon will be added to this equipment.

Machine Shops Have Large Lathes

The machine building includes machine shops Nos. 1, 2 and 3. Machine shop No. 1 is the tool shop and is equipped with 10 lathes with the necessary cutters, tool grinders, planers, shapers and milling machines. Machine shop No. 2 is equipped for handling guns up to 6-inch and has three heavy duty lathes 36 inches by 60 feet, two heavy duty lathes 42 inches by 40 feet, two triple gear lathes 60 inches by 40 feet, two double end borers 46 inches by 48 feet and one boring lathe 36 inches by 60 feet. This equipment is felt to be amply sufficient for handling all minor caliber gun contracts at the present time. Machine shop No. 3 is equipped for handling 14-inch to 16-inch projectiles. There are 11 lathes 36 inches by 20 feet and turret lathes, combination milling and turret lathes, etc., capable of handling shells up to 20 inches.

The armor or south unit of the ordnance plant is still in process of construction and is about 45 per cent completed. This unit covers 152 acres and when completed will comprise a plant of five buildings for the construction of armor plate and major caliber gun forgings. The open-hearth building located adjacent to the Chesapeake & Ohio railway tracks will be 125 x 516 feet and will contain two 65-ton open-hearths and two 30-ton electric furnaces. The largest ingots contemplated are those for armor plate which will weigh in the neighborhood of 200 tons. This building is equipped with one 250-ton crane, one 125-ton crane and one 75-ton crane, all of 100-foot span. The charging aisle is equipped with a 25-ton crane and the stock yard has two 15-ton cranes of 100-foot span.

Hydraulic Equipment for Armor

The forge and furnace building is located to the northward of the open-hearth and ingots are brought directly across to the furnace on a transfer track. This building is 477 x 644 feet and has two large wings containing furnaces with the press between these wings. Each wing has one 250-ton, one 200-ton and one 100-ton crane, all of 100-foot span. There also is one 75-ton crane over the press for erecting and repair purposes. The south wing contains the forge furnaces for armor and large guns and in addition two gun annealing, car-bottom furnaces, one 100 feet long and one 50 feet long. After proper heating the armor ingots are forged on the 14,000-ton press into plates varying in thickness from 4½ to 20 feet. Some of these plates are as much as 13 feet wide and 28 feet long. The large, round corrugated gun ingots are hollow forged on this press into lengths of 93 feet. After leaving the press the forgings go to the north wing of the building where the annealing, carbonizing, tempering and hardening furnaces are located. A boiler house with five 1000-horsepower boilers will be built near the forge building to produce steam for the press.

The heat treatment building is 112 x 320 feet and at the west end is built up to a height of 176 feet to accommodate the two vertical furnaces, one 10 x 105 feet and one 10 x 50 feet. The vertical quenching tank is 14 x 105 feet. Although some electric furnaces are used, both in the melt shop and heat treatment shops, natural gas will be used almost entirely in all other furnaces. There are three 75-ton cranes in this building.

The machine shop building of the south unit is 320 x 552 feet and contains machine shops Nos. 4, 5, 6, each of the three bays of the building being a separate shop 100 feet wide. Each of these shops is equipped with one 150-ton crane and one 75-ton crane. Machine shops Nos. 4 and 5 are for armor, machine shop No. 4 containing the armor plate grinders and the oxy-hydrogen plant, while machine shop No. 5 is equipped with open-side, platen and rotary planers, for armor machining. Machine shop No. 6 is the major caliber gun shop and will contain lathes for turning and boring the largest jackets and hoops up to those for 20-inch 50-caliber guns together with necessary vertical boring mills, planers, shapers, slotters, cold saws, etc.

The problem of housing the employes for the plant having been found a very difficult one, 85 houses with from four to eight rooms each were erected by the United States Housing Corp. at a total cost of $550,000.

The ordnance plant has obtained electricity from the West Virginia Water & Electric Co., Charleston, having financed this company to the extent of $40,000 for a pole line and transformer to the plant.

Gas is obtained from the United States Fuel Gas Co., Charleston, with whom a contract was made Oct. 22, 1917, for the installation of a 4-foot pipe line about 2000 feet in length to the plant and for the supply of natural gas at 8 cents per 1000 cubic feet. Later this pipe line was paralleled by an 8-foot line installed by the plant force. In addition to this source of supply of natural gas, negotiations with the Charleston Dunbar Natural Gas Co. in July, 1918, resulted in the contract for a five years supply of natural gas from the property leased by that company in the vicinity of Hurricane, W. Va. The high pressure 8-foot main delivers natural gas to the plant where it is distributed to the various units.

To Make Refractories

The New Castle Refractories Co. is the name of the company which recently took over the plant of the New Castle Stamping Co., New Castle, Pa. The new company plans to spend about $100,000 in improvements and alterations in the plant and to begin the manufacture of brick and clay products in the next month or so.

Walter S. Kupfer, president of the American Dressler Tunnel Kiln Co., New York, and treasurer of the Universal Sanitary Mfg. Co., New York, with a plant at New Castle Junction, Pa., is head of the new company. Paul Meehan, chief engineer of the Kupfer interests, will be in charge of the changes to be made in the old stamping works.

Heat Treating Steel Electrically

Furnaces of the Metallic Resistor Type Are Being Successfully Adopted for Handling Large Work—Automatic Temperature Recorder Control Increases the Range and Accuracy of Applications

BY E. F. COLLINS

METALLIC resistor electric ovens and furnaces for heating steel to temperatures not exceeding 1800 degrees Fahr. are proving dependable for heavy classes of work and, in combination with automatic and improved manual systems of temperature control, are becoming a factor in producing uniformity of quality. Furnaces of this type have passed the experimental stage and now are successfully handling large work in forge and machine shops.

An important use for electric heat in the steel industry has been developed in wire mills, where electrically heated ovens are employed for annealing and drying steel wire and rods. When an anneal is required in drawing steel wire to size through a series of dies, the coils of wire or rods are loaded into annealing furnaces where they remain from 8 to 10 hours. Sometimes the wire is loaded bare and sometimes it is packed in charcoal, sand or lime.

The use of electric heat in these ovens or furnaces insures an atmosphere free from products of combustion, producing an anneal with little scale since no oxygen is required to support combustion. The distribution possible with electric heat enables the charge to be brought uniformly to temperature, and the automatic control obviates the necessity of attention from the operator, insuring the proper temperature and soaking conditions to give uniformity of product from day to day, even though the charges vary in weight.

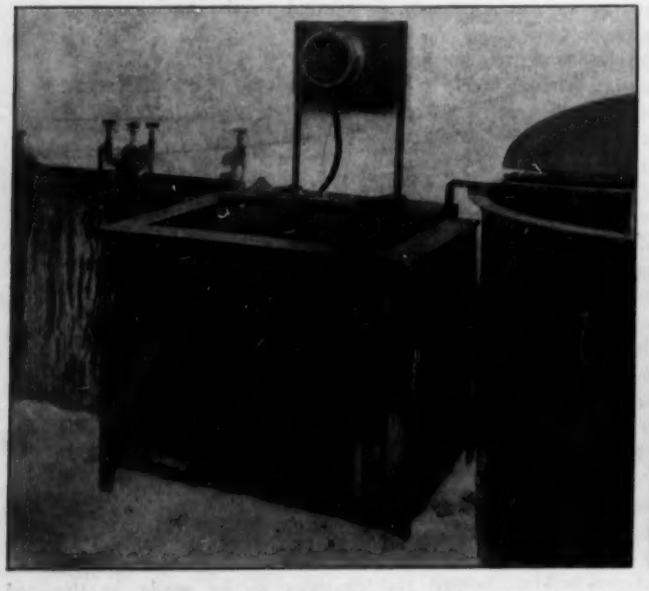
After this annealing, the scale must be removed by pickling in an acid bath, and following the pickling, the material is washed and dipped into a lime bath to neutralize any remaining acid, after which it is placed in the drying oven and the "acid in the steel" thoroughly dried out before further drawing is attempted. The dry heat of the electric oven results in rapid drying, providing the oven is equipped with a proper ventilating system for removing the evaporated moisture. The National Screw & Tack Co., Cleveland, reports that each of its three ovens turns out charges in 10 to 20 minutes. The installation requires only a moderate amount of floor space and is said to be economical in operation.

One advantage of the electric heat which became apparent in this process was entirely unexpected. When the material is dried in an electrically heated oven, the lime on the steel is left in such condition that in passing through the dies it neither affects the dies nor scratches the wire. This results in longer life for the dies and an unblemished product. It is said that in addition to an increase in productive capacity and the saving in dies, tests have shown a saving in fuel of 33 per cent.

The shrinking furnace was developed during the war period for assembling the hoops, jackets and breech blocks of guns and up to the present time its use has been largely confined to this work. The reliability and convenience of this furnace, however, makes it deserving of a wider application. It is suitable for many of the more common machine shop operations, such as the air drawing of carbon steels and the making of shrinking fits generally. It may be used for temperatures up to 1000 degrees Fahr.

This furnace, shown in Fig. 6, is a hollow cylinder consisting of an annular casting at each end connected by longitudinal ribs which provide the necessary structural strength. An inner and an outer casing of sheet steel are also provided, and the space between is built up with heat insulating bricks. The heating element consists of a number of units wound with a thin resistor ribbon on a suitable insulated support. These units are mounted on the inside

From a paper prepared for the Chicago meeting of the American Steel Treaters society, Sept. 23-27, 1919. The author, E. F. Collins, is industrial heating engineer, General Electric Co., Schenectady, N. Y.



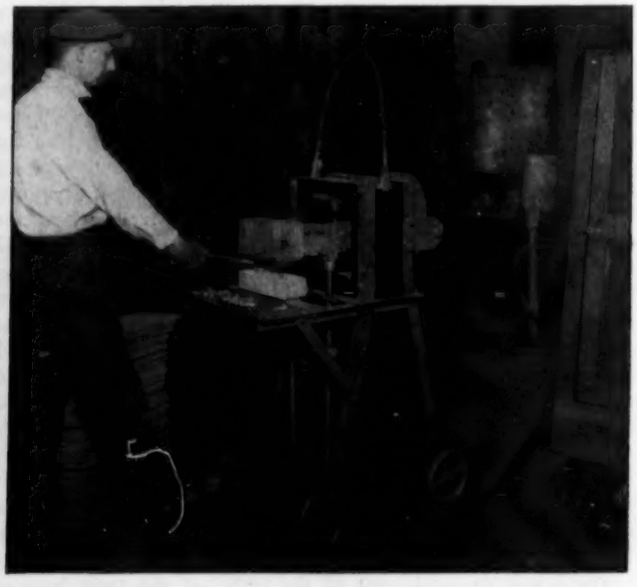


FIG. 1—AN OIL TEMPERING BATH WITH A THERMOSTAT FOR AUTOMATIC TEMPERATURE CONTROL. FIG. 2—A TYPICAL APPLICATION OF A CONDUCTION TYPE OF ELECTRIC RIVET HEATER. TWO RIVETS, FORMING PART OF THE ELECTRICAL CIRCUIT ARE HEATED AT THE SAME TIME

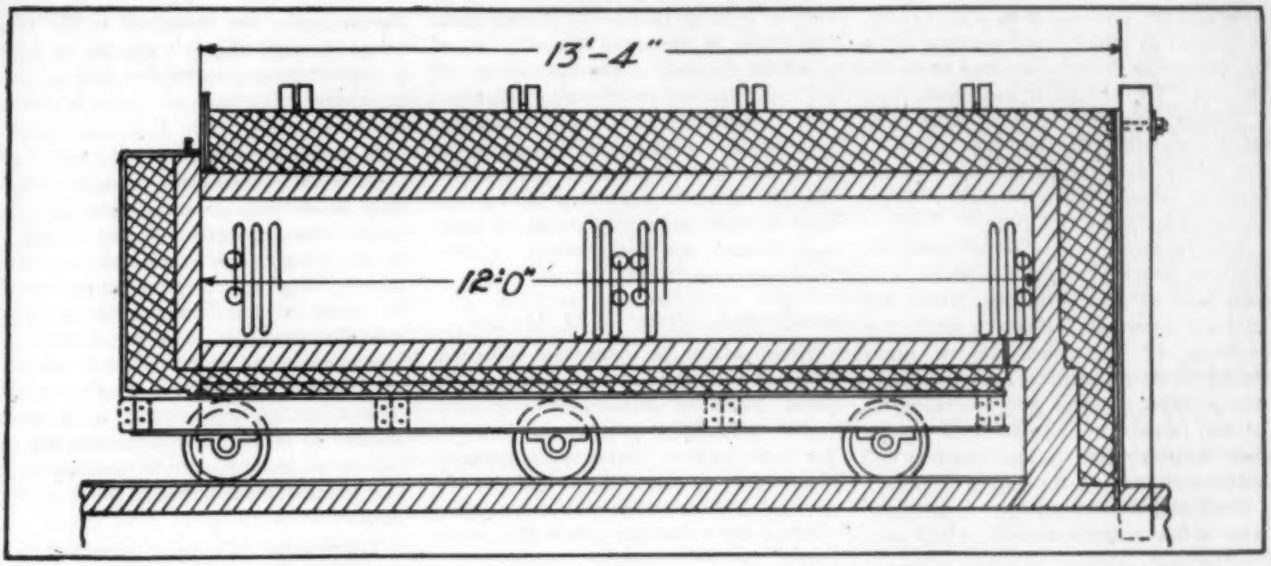


FIG. 3—SIDE ELEVATION OF AN ELECTRICALLY HEATED CAR BOTTOM FURNACE DESIGNED FOR HEAT TREATING OR ANNEALING

of the wall and connected in series or multiple in the proper relation for 110, 220, 440 or 550 volts, either one, two or three-phase. Guard rods are provided in front of the units. The furnaces are so designed as to be used singly or to be stacked one upon another to give a furnace of any desired height.

Four sizes of this furnace are available; a small size not designed for stacking, an intermediate size, a large size designed for stacking to a furnace of moderate height, and a large size 80 inches in diameter with heavy supporting columns, designed for stacking to a furnace height of 80 to 100 feet. Fig. 5 shows the arrangement of the heating elements in the large size furnace.

Automatic temperature control can be applied to these furnaces if only one or two sections are used, but for higher furnaces hand control is preferable since it is often desired to raise the temperature at certain specified rates and to heat portions of a forging to a higher temperature than other portions.

For this purpose control boards about the size and height of an office desk have been built and provided with a vertical section. An indicating pyrometer is set flush in the flat section of the desk and is provided with a selective switch so that the thermocouple in any section of the furnace may be connected to the pyrometer and the temperature read. Control switches, one for each section of the furnace, are mounted on the vertical section of the board, so that any furnace section may be connected to or disconnected from the line in accordance with the indications of the pyrometer. A recording pyrometer mounted on the vertical section transfers periodically from one thermocouple to another to permanently record all readings on the chart.

On account of the advantages of this type of furnace its use will unquestionably be extended as it becomes more widely known. High efficiency, uniform heat distribution, absolute and accurate control of temperature, ability to graduate the temperature from end to end, absence of noise, smoke and products of combustion and the ability to locate the furnace in any part of the shop are some of the advantages of this equipment.

Tempering Bath Has Automatic Control

For tempering dies and tools the electrically heated oil bath has found a very extensive use. It is produced in two sizes, one small and one large. The former is equipped with hand control and a thermometer and the latter is equipped with an instrument for automatic temperature control. Fig. 1 shows an oil bath of the large size equipped with a thermostat for automatic control. The circulation of the oil is such as to insure a uniform distribution of heat. The automatic control is a great convenience and an aid to accurate work. A cooling coil may be provided and is supplied with rubber hose connections to permit inserting and removing from the bath. The heating units are of sheath wire consisting of a wire of resistance alloy encased in sheath of steel, the space between wire and sheath being densely packed with a powdered material which serves as an electrical insulator.

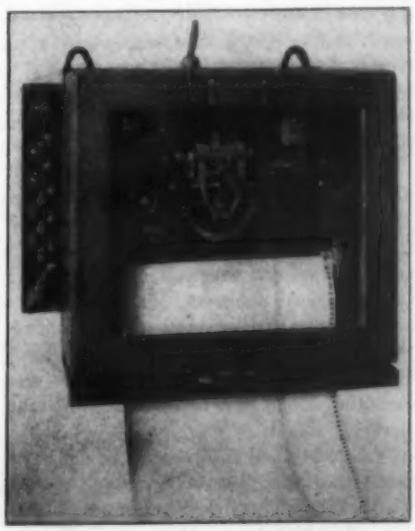


FIG. 4—TEMPERATURE RECORDER CONTROLLER USED IN CONNECTION WITH ELECTRIC FURNACES

Electric resistance furnaces of large size have not been built until very recently, principally because the proper materials for use as resistors and as refractory insulators had not been developed, and also due in part to the fact that the physical laws governing the dissipation and conservation of heat were not sufficiently established as to have had a broad application. Further, instruments for the automatic control of temperature had not been developed to the point where they were sufficiently rugged, accurate and reliable to be suitable for industrial purposes.

Excepting the granular carbon or coke resistance furnace, the building of large resistance furnaces for high temperatures, such as are required for annealing and hardening, had not been accomplished until the summer of 1917 when a number of them were designed for use in the manufacture of ordnance—a field where they were found to be well suited. These furnaces embody many entirely new ideas in design and control.

They are of the vertical cylindrical

type, and are provided with a split cover, the halves of which move aside to allow the charge to enter or emerge from the furnace. The charge is suspended from a fixture provided with a suspending shaft, extending through the center of the cover and supported on I-beam girders outside the furnace. These swing aside when charging.

The furnace consists of a cylindrical shell of boiler plate within which a 9-inch wall of heat insulating bricks and an inner lining of firebrick is built. The resistors, 12 in number, are of heavy ribbon ¾ x .101-inch. They are formed into a series of loops and are supported in the furnace on insulators of refractory material, set in the furnace wall to form a part of the lining.

Each end of each resistor is provided with a heavy terminal stud which projects through the furnace wall to carry external connections to the power circuit. The resistor ribbons are welded to the outlet studs and all splices in the ribbon, if any occur, are also welded. Material for the resistors is a very high grade alloy which will not oxidize or deteriorate at temperatures below 2000 degrees Fahr.

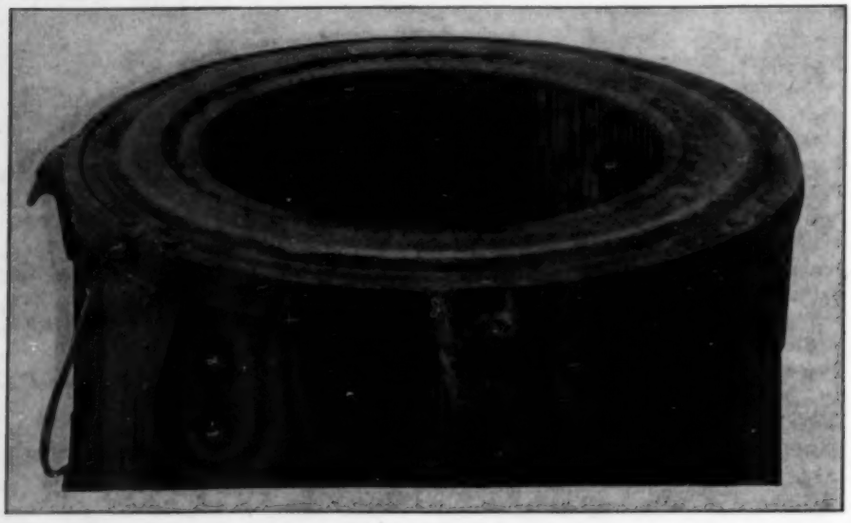


FIG. 5—LOOKING INSIDE A 66-KILOWATT FURNACE 6 FEET 8 INCHES IN DIAMETER. NOTE THE ARRANGEMENT OF THE HEATING ELEMENTS

Constructed in Units

Since the resistors are supported on the inside of the furnace wall, the heat is transferred from the resistor to the charge largely by direct radiation. The resistor runs at a comparatively low temperature, only 100 to 200 degrees Fahr. above the temperature of the charge, compared to that of a muffle furnace, in which case the heat must first be forced through the walls of the muffle. The resistor is located away from the walls, so that it can readily dissipate its heat. Each ribbon is a unit by itself and the furnaces may be built as high as desired by adding units. One ribbon is connected to each phase of a two or three-phase circuit, so that two or more ribbons constitute a polyphase unit or section, which gives a balanced load on the power circuit and is treated as a unit in the system of control. The furnace, therefore, is called a four section furnace, since it contains 12 windings divided into four groups of three windings each.

Furnace Controlled by Sections

Each section is controlled independently of the other sections by a control panel. This is accomplished by automatic controlling instruments, one set for each section, operating in conjunction with suitable relays and a contactor, so that when the temperature reaches the value for which the instrument is set, the relays and contactor operate to disconnect the section from the power line. When the temperature has fallen slightly the relays and contactors are operated in the reverse order again connecting the section to the line. Fig. 4 shows the type of the temperature recorder controller used.

The control instrument may be set to hold any desired temperature and is provided with a paper roll and recording mechanism, so that indicating, recording and controlling features are all combined in a single instrument. Thermocouples are the means for measuring temperatures, two of which are used in each furnace section, one near the resistor and the other on the surface of the charge.

A rotating switch connects periodically first one and then the other of the thermocouples to the instrument, thus recording the temperature of both, the record being a series of oscillations from one thermocouple to the other. The thermocouples are connected to the two relays through the instruments in such a manner that the resistor couple controls one relay and the contact couple the other.

It has been found desirable to control from the resistor couple rather than from the contact couple for the reason that the resistor, being of small mass, changes in temperature quite rapidly, thus giving a sensitive means of control. The charge, having considerable mass, is slow to change its temperature, and moreover, it is not desired that its temperature should change. The object of this control is to raise the charge to the desired temperature as rapidly as possible and to maintain it at exactly that temperature as long as desired.

Temperature is a most important factor in heat treating, and the chief difficulty has always been to obtain accurate temperatures uniformly distributed throughout the furnace and to maintain them accurately for the required time. Adverse conditions have frequently resulted in a nonuniform product, making it necessary to retreat material with a serious loss of time, labor, fuel and productive capacity.

In the furnace described, the inner wall carries the resistor windings, all of the same size, all carrying the same current, and assuring a uniform distribution of heat at low temperature gradient. The control is entirely automatic and insures an accurate and constant temperature of the value desired.

It is significant that forgings treated in these furnaces remain straight, the slight distortion which does occur requiring a minimum of the straightening. Operators attribute this to the uniform heat distribution and the freedom for the charge to float through the critical zone without forcing. Furnaces of this type may be built in almost any form, size or capacity and may be adapted to meet the needs of the general steel workers for temperatures not exceeding 1800 per cent. Fahr.

Many Applications Are Possible

The large high temperature furnaces for heat treating gun forgings were the first of their type built but there are numerous industrial processes to which these furnaces may be applied, such as carburizing and annealing brass, copper and steel sheets, strips, tubes and wire. In Fig. 3 is shown a car bottom type of furnace. They may also be built with a continuous moving conveyor or with a circular rotating hearth for special applications.

Similar resistor and resistor supports are used in all these furnaces, the re-

sistor at times being a 1 x ⅛-inch heavy ribbon of the resistance alloy.

An electric conduction furnace has been developed for heating rivets. It consists essentially of a transformer, the secondary of which has been designed to give heavy currents at a low voltage the rivet itself forming a part of the circuit and being heated by the passage of current. Preferably, a rivet should be heated from the inside. The shank may be desired hotter than the head, yet the rivet should be heated uniformly throughout its length. These are ideal upsetting conditions, and further, the head being cooler is less malleable and therefore less likely to be marred by the backing up tool.

It has been found by experiment that in order to butt weld two pieces of steel or copper with an electric current, it is usually necessary to preheat the ends which are to be welded together, if burning at the weld is to be avoided. For example, when the current is first passed through a cold joint, the heat concentrates at the joint to such an extent as to burn the piece. If now the current be cut off as soon as the joint reaches a red heat, the heat travels back into the pieces and raises the temperature of the entire length held between the jaws. If after a few seconds, the current is again applied, there is less tendency to burn at the joint and the weld can usually be made without further interruptions. The number of times it is necessary to pass the current through a joint before the weld is made depends on the size, shape and preparation of the joint.

This principle applies in like manner when heating rivets by an electric current. If a conduction rivet heater is constructed with only one pair of jaws or with several pairs in multiple, so designed that the current through the rivets is not interrupted while they are being heated, the rivets probably will overheat at the end before the shank and head have become sufficiently heated. Frequently it is necessary to remove a rivet, which has become overheated at the end and allow it to soak until the heat has become distributed before it could again be put into the jaws and heated satisfactorily. This tendency can be eliminated by designing the machine to heat two or more rivets in series as distinguished from multiple, so that when a hot rivet is removed for driving, the current is broken through the remaining rivets. The time interval, which thus elapses until a cold rivet can be inserted, gives the required soaking period for the heat in the remaining rivets to diffuse and results in a more uniform heating when the circuit is again completed.

As previously stated a rivet should preferably be heated from the inside. With this conduction type of heater, the current passes through the rivet lengthwise and the energy is expended inside the rivet. The shank is uniformly heated throughout its length and the head, having a larger cross section, need not attain as high a temperature as the shank.

This machine, shown in Fig. 2, has two pairs of jaws and heats two rivets in series. It has a capacity of approximately 75 pounds of rivets per hour, consuming at this rate about 15 kilowatts with a load factor of 80 per cent. The weight is approximately 530 pounds.

Having the secondary movable with respect to the primary and core is a feature of this heater, accomplished by making the secondary of two arms or

FIG. 6—ELECTRIC SHRINKING FURNACE WITH COVER. INSIDE DIAMETER IS 27 INCHES AND THE CAPACITY 8 KILOWATTS

bars of heavy copper which extend through the windows of the shell type core and hinged at one end so that each arm can be moved independently of the other. The arms are connected together at the hinged end by a heavy shunt of leaf copper and the electrodes for holding the rivets are mounted on the other end. The electrodes or jaws also are of copper. They are large and the surfaces are corrugated in order that they may dissipate the heat generated in them without auxiliary cooling by water.

The transformer is mounted on a stand made of angle iron, and two pedals, one for each of the arms above referred to, are provided to raise each arm independently of the other. The heater accommodates rivets up to 5 inches long, no adjustment being required for the various lengths. The operator raises the electrodes by means of the foot pedals to any desired height.

The absence of smoke and gases in boiler shops, fabricating sheds, and the holds of ships under construction, enable not only the riveters but all workmen in their vicinity to work at a higher efficiency. Loss from burned rivets, which in ordinary practice is a very considerable item, can be eliminated because heat is available for use instantly whenever required and heating is accomplished so quickly that it is unnecessary to keep rivets hot in anticipation of the demands of the riveters.

Secrets of Foundrymen Removed by War

H. A. Neel, metallurgist, Michigan Steel Casting Co., Detroit, outlined standards of steel casting practice in an address delivered at a joint meeting of the Cleveland chapter, American Steel Treaters' society and the Steel Treating Research society held Monday evening, March 1. The speaker stated that the war broke down secrecy among steel castings makers and advanced the industry to a marked extent. Physical properties were urged as the proper basis for specifications, and the popular belief in the malign influence of sulphur in small amounts was pronounced false. Mr. Neel stated that fully 50 per cent of the loss in steel castings is due to lack of co-operation in casting design. Poorly designed castings fail through lack of proper feeding to compensate shrinkage, or structural weakness allowing cooling strains, which the lighter sections cannot resist successfully.

Mr. Neel spoke of the work which has been done in heat-treating steel castings. He stated that this treatment yields as great improvement in steel castings as it does in rolled products He believes that all castings exposed to shock, impact or repeated stress should be annealed at a temperature of 1600 to 1650 degrees Fahr., allowing one hour's time for each inch in thickness of section. Air quenching increases the elastic limit by 25 per cent, and the quenching temperatures for castings are slightly higher than those observed in heat-treating forgings. Alloy steels respond readily to heat treatment. The speaker cited some experimental work on a steel which contained 0.28 to 0.29 carbon, 0.8 to 1 per cent chromium and 0.5 molybdenum. This steel, after heat treatment developed an elastic limit of 135,000 pounds per square inch, an ultimate strength of 150,000 pounds per square inch, an elongation of 14 per cent and reduction in area of 32 per cent. Favorable results have been obtained from experimental research on vanadium alloys, but up to the present time, cast titanium steel has not proved satisfactory under tests.

Handling Material Economically

Many Labor and Time Saving Devices Available to Manufacturers, but Plant Requirements Must Be Studied Carefully to Obtain Best Results from Their Use —Efficient Handling Prevents Friction Among Workmen

BY M. H. POTTER

PROPER transportation and handling of materials before and during manufacture will effect a pronounced saving. Numerous devices and systems have been perfected with this aim in view, but the problem as related to many individual shop operations has not been solved. When considering means for increasing production or decreasing cost of manufacture, the manufacturer will do well to study the transportation problem. The problem in each case will have its own peculiarities, but there are general rules that will serve to obtain results.

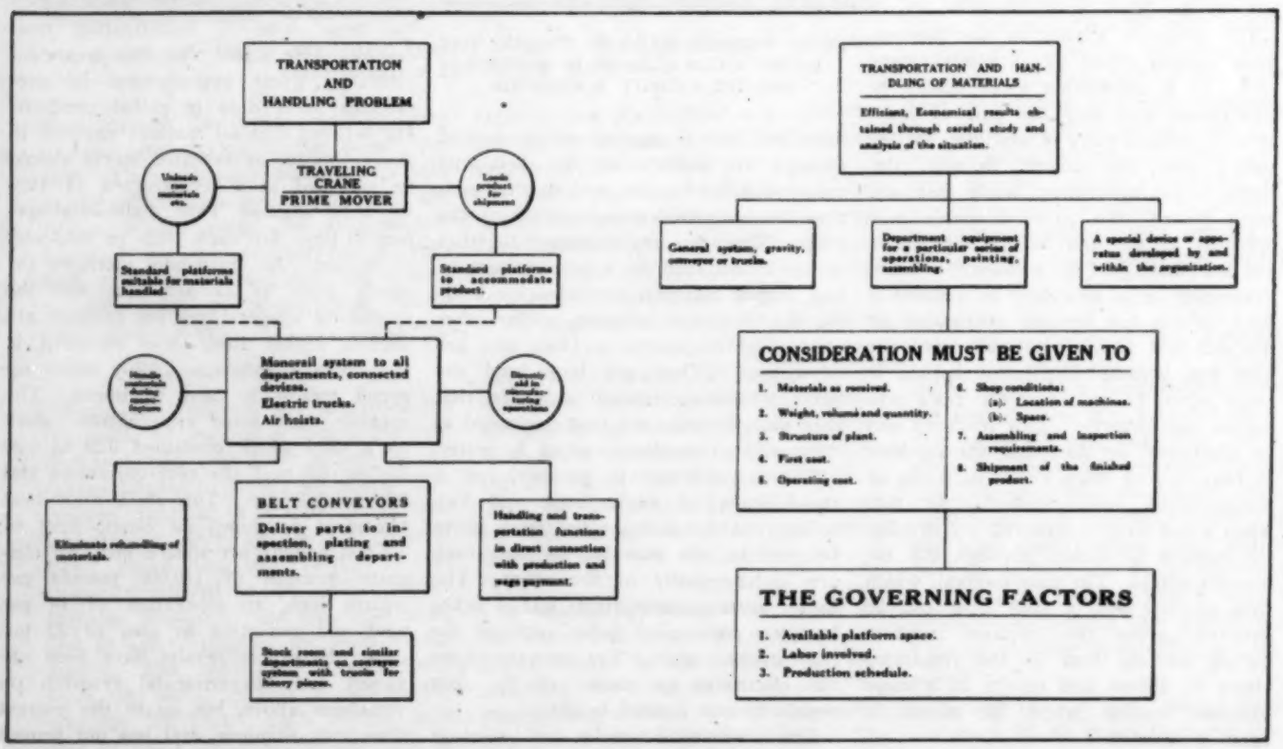
In considering the installation of labor saving devices a careful study should be made from a practical standpoint. First cost generally is not so important as many manufacturers believe. It is more important that maximum results be obtained from the devices after they have been installed. The following advantages should be aimed at: The use of gravity whenever possible; the double use of a device, that is, as a distributor and as a collector; a reduction in the number of times material is handled, and the keeping of material on the same level.

Shop conditions will govern the types of handling devices that may be used to advantage. Local conditions often necessitate the designing of special handling equipment, and in such circumstances attention should be given to the simplicity of the devices originated. Definite plans should be prepared and well developed before any attempt is made to install them. A study of present systems of handling materials will be of assistance, and generally it will be discerned that time has been lost in rehandling materials.

Production schedules often will not permit of alterations, but labor saving devices may be installed without such inconveniences when extensions are made. Before a plant is built the transportation problem should be given careful consideration. Not only should the layout of machinery be studied, but the structure should be planned to meet the transportation problem. All operations should receive attention, from the time raw materials are received until the finished product is shipped. The railroad siding must be equipped with the best facilities to expedite loading and unloading. The building must be designed to aid transportation facilities. Platforms and storage spaces must be ample to meet all reserve requirements, and must be used to the best advantages. Handling and rehandling of materials is expensive.

Plants producing general commodities have not been slow in installing the most-up-to-date labor and time saving devices, but manufacturers in some other lines have been indifferent about them, no doubt due to the first cost. Labor must be considered in connection with the cost of handling materials. Care should be taken not to adopt any device that will overtax the laborer. Efficient handling of materials will have a tendency to prevent labor trouble. The labor required to maintain a handling system throughout the plant should be considered from the viewpoint of cost, and a new system before being decided upon should have to its credit a record of

This is the fifth and final article of the series on modern industrial methods written for THE IRON TRADE REVIEW by M. H. Potter.


TRANSPORTATION AND HANDLING PROBLEM
TRAVELING CRANE PRIME MOVER
Unloads raw materials etc.
Loads product for shipment
Standard platforms suitable for materials handled.
Standard platforms to accommodate product.
Monorail system to all departments, connected devices.
Electric trucks.
Air hoists.
Handle materials during manufacturing operations
Directly aid in manufacturing operations
Eliminate rehandling of materials.
BELT CONVEYORS
Deliver parts to inspection, plating and assembling departments.
Handling and transportation functions in direct connection with production and wage payment.
Stock room and similar departments on conveyor systems with trucks for heavy pieces.
TRANSPORTATION AND HANDLING OF MATERIALS
Efficient, Economical results obtained through careful study and analysis of the situation.
General system, gravity, conveyor or trucks.
Department equipment for a particular series of operations, painting, assembling.
A special device or apparatus developed by and within the organization.
CONSIDERATION MUST BE GIVEN TO
1. Materials as received.
2. Weight, volume and quantity.
3. Structure of plant.
4. First cost.
5. Operating cost.
6. Shop conditions:
(a). Location of machines.
(b). Space.
7. Assembling and inspection requirements.
8. Shipment of the finished product.
THE GOVERNING FACTORS
1. Available platform space.
2. Labor involved.
3. Production schedule.

ELEMENTS IN EFFICIENT HANDLING OF MATERIALS

decreased cost of labor. This is fundamental, but in many instances this factor is not thoroughly analyzed before a new system is adopted.

Automatic conveyors of both the gravity and mechanical types generally have been adopted and great saving has been effected by means of them. Plant equipment, manufacturing methods, length of operation and the routing of work will determine the practical value of such devices. The aids to manufacture, templates, jigs, fixtures, etc., must also be taken into consideration. If the articles are small or light it is an advantage to provide suitable receptacles, and design the conveyors to handle them. In many instances conveyors can be used not only to transport material but to perform some other definite operation.

Industrial railways have been developed to a great degree of efficiency and there are numerous handling devices which can be used in connection with them. It is only necessary to investigate conditions to determine where and how a saving in the cost of transportation may be effected. For example, an industrial railway of the steam, gasoline or electric type may be found to be a necessity, but unless certain other devices are employed, the maximum results are not obtained. It is through the use of such additional handling equipment that present transportation costs may be greatly reduced. In many cases the industrial railway is the backbone of the transportation system both outside and in the factory, and it is important that all related devices should be designed to function in harmony with it. There is a wide range of equipment available for this purpose. The question of practical usefulness is to be answered by the conditions under which the apparatus must work. Rapid loading and unloading devices aid greatly in minimizing handling costs. Trailers, detachable bodies and similar equipment is necessary, depending on the materials to be handled and the connected facilities.

Shop and yard cranes for lifting and transporting material have many related devices to facilitate handling. Not only when heavy material is to be moved are cranes of real value, but light loads are efficiently handled, due to the fact that the crane may have a wide range and at the same time not interfere with work or cause congestion. There are various types of devices admirably adapted to the purposes.

Overhead monorail systems and small cranes fitted with air hoists may be used effectively under many conditions, but it is important to link together the various handling systems with a view toward eliminating the delays and costs of rehandling material. The system that will function not only as a separate unit but as a part of the entire handling system is the most economical.

When endeavoring to increase the benefits derived from the use of hand trucks, the labor factor must be considered. Too heavy a load, although it may be moved by a number of laborers, is to be avoided. Trucks capable of being handled by one laborer are much more advantageous. Special platforms are decidedly useful. Automatic machinery may balance production with a comparatively small number of machines. It may be necessary under such conditions to vary the delivery of material under manufacture from a number of machines to a few machines, or the reverse. The most profitable handling system will be the one that is capable of delivering the material as wanted.

The accompanying chart illustrates practical suggestions for solving transportation and handling problems.

Domestic Clays Supplant German Product

American brass and steel manufacturers until the war held that graphite from Ceylon and German Klingenberg clay were necessary in the making of brass and steel melting crucibles. Consequently, most of the graphite and bond clay used in the manufacture of crucibles were imported.

When the war came and the manufacturers were deprived of these imports, the United States bureau of mines began experiments to see if the socalled inferior American clays would answer the purpose. Over 450 full sized crucibles have been made at the ceramic station of the bureau of mines at Columbus, O., and tested in brass making and steel smelting. Two different tests made on brass melting crucibles in two different foundries indicate that the domestic flake graphite gives a crucible of greater service than those made from Ceylon graphite. The bureau states that these two tests are not sufficient to be conclusive and more extensive tests are now in progress to determine this point.

Of the bond clay tests, the bureau states that the work has been sufficiently thorough to indicate that there are two American clays superior to the German Klingenberg clay for bonding brass melting crucibles and that there are 13 American clays ranking higher than the Klingenberg clay for steel melting crucibles.

Insofar as bond clays for graphite crucibles are concerned, the bureau of mines says the United States is now nationally independent, the hold which the German Klingenberg clay held on the crucible trade having been finally broken. It is declared that the United States will never return to the use of Klingenberg clays.

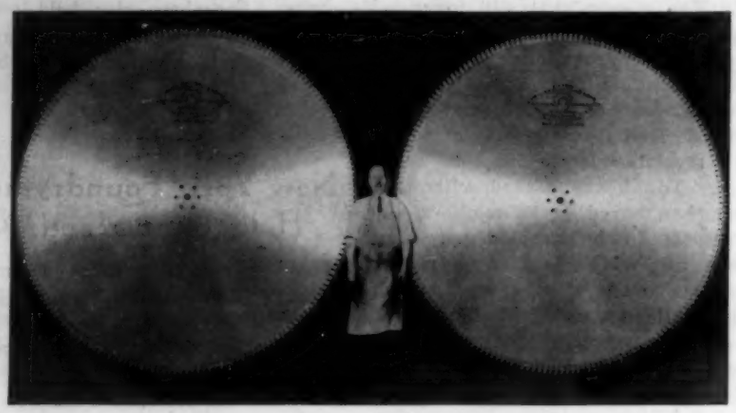
New York Foundrymen Hold Joint Meeting

Foundry associations in the metropolitan district met Thursday, Feb. 26, under the auspices of the Gray Iron club of New York, at the Building Trades Exchange building, 34 West Thirty-third street, New York. In addition to the members of the Gray Iron club, large representations were present from the Newark Foundrymen's association, the Metropolitan Brass association and the Associated Foundry Foremen of New York and vicinity. Following a dinner, J. M. Graham, Elevator Supply & Repair Co., Hoboken, president of the Gray Iron club, who presided as toastmaster, welcomed the members and their guests and in response, Arthur E. Barlow, of Barlow Foundry, Inc., Newark, spoke on the value of co-operation. Mr. Barlow, in view of the value of these allied meetings in the metropolitan district, said that it is the intention of the Newark Foundrymen's association to invite the other association to a third joint meeting to be held in Newark shortly, where the first of these meetings was held in Newark several months ago.

The speaker of the evening was Dr. Richard Moldenke, whose subject was "Metallurgy." Dr. Moldenke spoke extensively on cupola practice and the effect of various ingredients on metal mixtures, and he traced the connection between casting troubles such as blow holes, cold shots, etc., to the mixtures and the fuel employed. S. Ford, a humorous speaker, who was introduced as Senator Ford, followed Dr. Moldenke with an entertaining address.

Estimates by the United States geological survey indicate that production and shipments of Portland cement in 1919 increased 13 and 21 per cent, respectively, over those of 1918, and that stocks decreased 52 per cent. The industry was set back considerably in 1918, when war restrictions reduced the shipments from 90,703,474 barrels in 1917 to 70,915,508 barrels, but is now regaining lost ground. Shipments in 1919 amounted to 85,485,000 barrels, valued at $144,461,000, while production amounted to 80,287,000 barrels.

Large Circular Saw. Requires Half-Ton of Steel

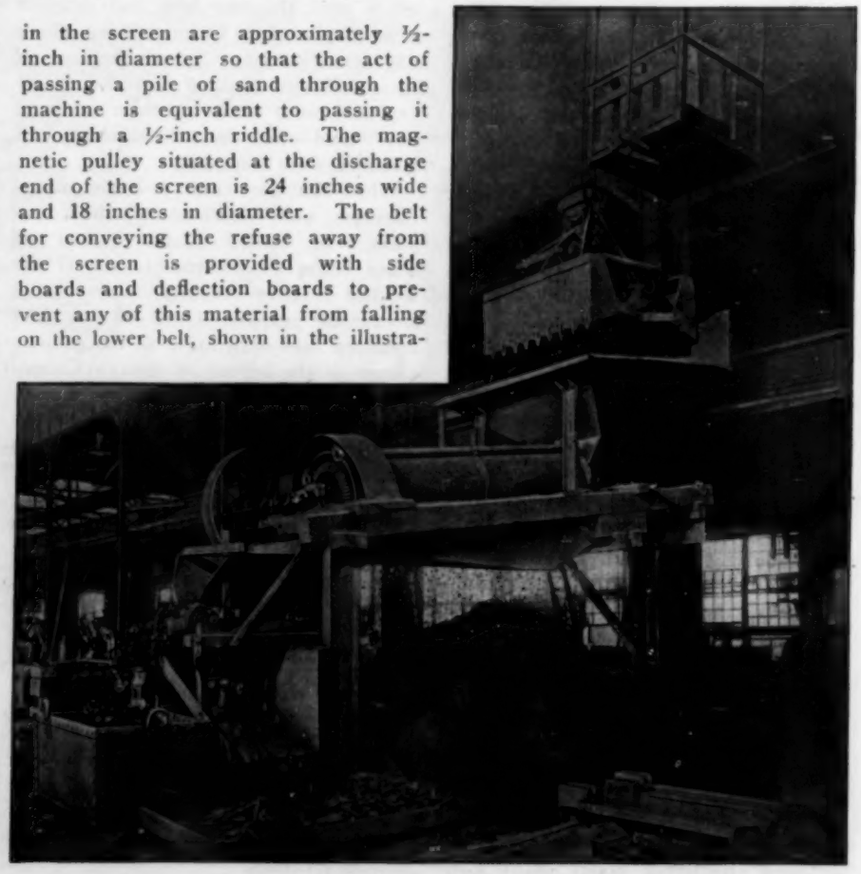


TWO large circular saws of the spiral inserted tooth type, said to be the largest saws in the world, recently were finished by Henry Disston & Sons, Inc., Philadelphia, and will be used for cutting shingle blocks from trees on the Pacific coast. Each of the new saws measures nine feet in diameter and has 190 teeth inserted in the rim. An ingot weighing 1140 pounds was required when the saw was started but after reheating, rolling and trimming, the remaining weight was 795 pounds. In comparison a 54-inch saw, just half the diameter of the large saw, requires an ingot weighing 180 pounds and is reduced to 125 pounds when finished. In the manufacture of these unusually large saws standard machinery was used throughout, the only additional facilities required being extra man power as holders up during the smithing process. The peripheral speed of these saws in operation will be about 130 miles per hour.

Sand Mixer and Magnetic Separator Combined

An installation, designed and built by the Dings Magnetic Separator Co., Milwaukee, is shown in the accompanying illustration. The equipment which includes a sand mixing and riddling system with a magnetic separator, is strong and ruggedly constructed. It is mounted on a platform at a sufficient height from the floor to allow the screened sand to be piled at a point on the floor from which it can be removed by barrow or grab bucket. The box or other receptacle for catching the refuse is also located on the floor level. It usually is provided with handles by which it can be lifted by the crane and conveyed to a car or truck employed for transporting that kind of material to the dump.

By referring to the illustration it will be noted that the complete machine consists of a feed hopper, a large revolving screen and a magnetic pulley with suitable motor, pulleys and belting to drive it. The feed hopper which has a capacity of 3 or 4 yards is situated at the head end of the screen and is kept supplied with material by a grab bucket operated by an overhead crane. The perforations in the screen are approximately ½-inch in diameter so that the act of passing a pile of sand through the machine is equivalent to passing it through a ½-inch riddle. The magnetic pulley situated at the discharge end of the screen is 24 inches wide and 18 inches in diameter. The belt for conveying the refuse away from the screen is provided with side boards and deflection boards to prevent any of this material from falling on the lower belt, shown in the illustration. Under the ordinary system of cutting over sand either by hand or mechanically, none of the foreign material is removed unless it happens to be quite large and cannot be ignored. It is claimed for the magnetic separator that it screens all of the sand and leaves it in condition for molding purposes; that it eliminates all the coarser material and while this latter is passing over the magnetic pulley it reclaims all the iron which may have found its way into the sand during the day. Clamps, gaggers wire, rods, slings, chills, small castings, pieces of scrap are all salvaged while the burned cores, brick bats, etc., are discharged into an iron box for final disposition on the dump.



CONTINUOUS RIDDLING AND SEPARATOR PLANT OF LARGE CAPACITY

Wheel Merger Elects

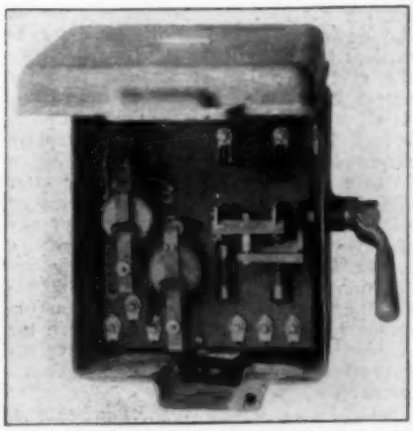
Officers of the newly-formed Motor Wheel Corp., Lansing, Mich., with a capitalization of $11,000,000, composed of the Prudden Wheel Co., Weir & Lesh Mfg. Co., Gier Pressed Steel Co. and the Auto Wheel Co. have been elected as follows: Chairman of the board, William Newbrough; president, Harry Harper; vice president and treasurer, B. S. Gier; and secretary, W. C. Brock. Both wood and steel wheels for passenger automobiles and trucks will be manufactured.

Develops Safety Starter for Small Motors

An automatic starter of the inclosed type which may be operated by a self-contained knife switch with external handle, or controlled from a remote point by a push button master switch, recently has been developed by the Cutler-Hammer Mfg. Co., Milwaukee. The equipment, as shown in the accompanying illustration, consists of an automatic motor starter panel of the counter electromotive force type, completely inclosed in a cast-iron case with a hinged cover.

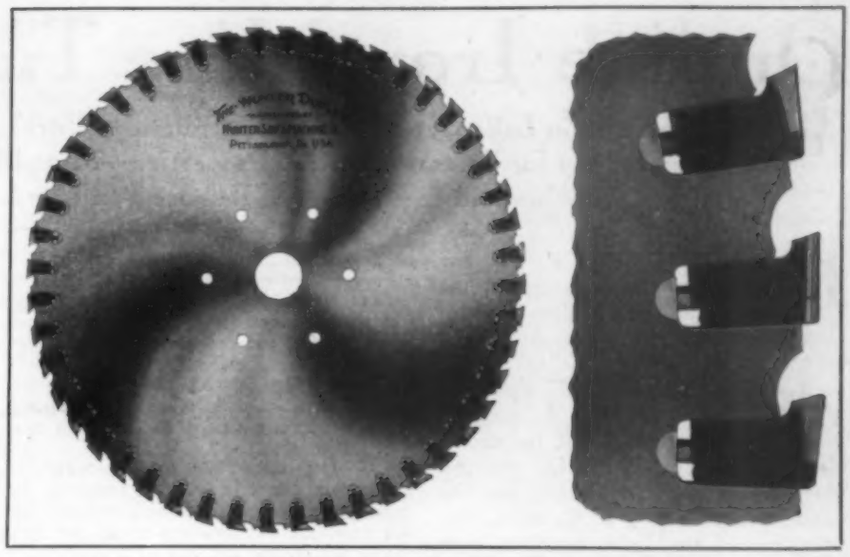
An accelerating contactor is the automatic feature and closes when the motor attains three-fourths speed to shunt out the starting resistor. A magnetic main line contactor mounted on the panel allows remote control from two push button switches. Pressing the "run" button closes the main line switch to start the motor and pressing the "stop" button produces voltage failure causing the main line contactor to drop out and stop the motor. By using a separate field rheostat, speeds above normal can be obtained if the range does not exceed two to one. A common snap switch, a float switch or a pressure regulator can be used for remote control also.

For manual operation of the switch,



A SAFETY DEVICE PREVENTS STARTING THE MOTOR WHEN THE COVER IS OPEN

the magnetic main line switch is omitted and the motor is controlled by a fused knife switch mounted on the panel with an operating handle outside of the case. The handle can be locked in the open position to prevent unauthorized operation. Interlocks prevent lifting the cover while the switch is closed or throwing the switch with the cover open. When the knife switch is used, low voltage release is inherent in the accelerating contactor. Low voltage protection is provided with a 3-wire push button control. The inclosing case is arranged for conduit wiring and can be mounted on a wall or any flat surface. This starter is designed for use with small direct-current motors not rated over 2 horsepower at 115 volts or 3 horsepower at 230 volts.



THIS SAW MAKES POSSIBLE THE ADJUSTMENT OF INDIVIDUAL TEETH FOR HEIGHT

Talks on Refractories

Discussing the subject of refractories from several different angles, Mr. Raymond M. Howe, of the Mellon Institute of Industrial Research, Pittsburgh, was the principal speaker at the March meeting of the New England Foundrymen's association Wednesday, March 10. His paper covered first the manufacture of different refractories and second the installation of fire brick in various types of furnaces, cupolas, etc., with particular reference to the service obtained from different methods of installation.

A meeting of the electrical engineers of the country will be held in Pittsburgh, March 12, at which there will be a general discussion on subjects relating to the use of electric power, particularly as applied to the operation of railroads. The visit of the engineers will include an inspection of the East Pittsburgh works of the Westinghouse Electric & Mfg. Co., where some large electric locomotives are being built for the Chicago, Milwaukee & St. Paul railway.

Employes of the Mullins Body Corp., Salem, O., have been given the privilege of purchasing stock in the concern, and many are doing so. The stock is selling at $44 a share and employes are permitted to subscribe up to 20 per cent of their earnings.

Designs Adjusting Device for Saw Teeth

A simple arrangement for adjusting the teeth of inserted tooth saw blades to the proper distance from the center of the saw recently has been developed by the Hunter Saw & Machine Co., Pittsburgh. The high-speed steel teeth, as shown in the accompanying illustration, are supported by hexagonal head, heat-treated steel screws and half-round removable steel nuts imbedded in the body of the saw blade. A milled tongue in the semicircular nut pocket fits into a groove in the nut, holding the nut firmly in place and preventing any side movement. A clearance hole drilled into the body of the saw blade at the bottom of the nut pocket and just large enough for the screw, serves as a receptacle for that portion of the screw projecting through the nut when the tooth is set in its lowest position.

This arrangement permits the adjustment of one or more teeth independently of the others. As all teeth do not wear equally and are subject to chipping on the cutting points, it frequently becomes necessary to remove one or more teeth for regrinding or replacement. In either case, each tooth must be readjusted to its proper relative position with the other teeth. The screws and nuts are easily removed or replaced if they become damaged or worn through service. After setting to the proper height, the tooth is securely clamped in position by a grooved hardened steel wedge or key. The teeth are alternately round and square nosed, the round teeth being slightly higher than the square to serve as leaders.

Outline Iron Mine Tax Methods

Leading Operators in Lake Superior District Submit to Bureau of Internal Revenue Recommendations for Valuation of Ore Properties—Mutually Satisfactory Interpretation and Application of Income Tax Law Likely to Result

REPRESENTATIVES of the operators of iron mines in the Lake Superior region met recently with officials representing the bureau of internal revenue to discuss methods of valuation of iron ore mines for purposes of the income tax, methods of computation of the depletion rate and other relative matters. On the part of the operators, the discussions were led by R. C. Allen, vice president of the Lake Superior Iron Ore association; George M. Humphrey, general attorney, M. A. Hanna & Co.; William P. Belden, general counsel, Cleveland-Cliffs Iron Co.; W. W. White, general counsel, Oglebay, Norton & Co., and Mr. Austin, representing the United States Steel Corp., and others. On behalf of the commissioner of internal revenue, discussions were presided over by Chairman Talbert, of the tax advisory board.

The conference was held at the invitation of the commissioner of internal revenue, the purpose being to reach a mutually satisfactory basis of procedure under the law and the income tax regulations. Inquiry among some of the interests in Cleveland who attended this conference revealed a common opinion that a basis of valuation of Lake Superior iron mines which will be mutually satisfactory to the commissioner and the iron ore operators, will be adopted.

The following is an outline of the recommendations which were made by the iron ore operators and which formed the basis of the discussion:

We approve Article 206, Regulation 45, "Determination of fair market value of deposits." Whenever the taxpayer is required to value his mining property, whether such property is a freehold, leasehold, or any other interest, full or fractional, he should be permitted to use all such relevant information, methods and devices as may be at his disposal. The value determined by the taxpayer should be scrutinized by the commissioner and tested as to its accuracy and reasonableness by such methods as seem to him proper and efficacious.

FAIR MARKET VALUE OF IRON MINES: In the absence of more conclusive evidence the following general method is applicable to the determination of the "fair market value" of an iron mine of the Lake Superior type:

(1) Determine the recoverable tonnage of iron ore measureable and reasonably assured and available within a period of not more than 45 years.

(2) Determine the average profit per ton to be expected for the life of the property by substracting the cost per ton at point of delivery from the selling price per ton at the same point, taking into consideration the general trend of selling prices of iron ore and cost of production.

(3) Determine the total recoverable profit for the life of the property by multiplying the net available tonnage by the expected net average profit per ton.

(4) Determine the life of the property by dividing the total tonnage by the expected average annual production in tons.

(5) Determine the present cash value of the expected full returnable profit of the property by reduction to present worth by the use of an appropriate fair interest return on capital invested in the iron industry.

Made Some Recommendations

With respect to the application of the foregoing method of valuation to iron mines we make the following recommendations:

(a) With respect to a mine or unit of operation it should be permissible to estimate recoverable tonnages of ore by commercial grades, and to value the respective tonnages separately. The sum of the values of the separate tonnages would then constitute the value of the mine; but for purposes of depletion unit values for each of the several grades or classes may be established and in such case may be used in computing the depletion deduction under the unit method as defined in Regulations 45.

(b) In the determination of the values of iron mines, hazard or risk should not be treated in the calculation as a function of interest; the risk element should be accounted for in the estimation of recoverable tonnages, grades of ores, net earnings or profits, operating life, etc., that is to say in each factor separately, so that an ordinary or investment rate of interest may be properly used in reduction of total estimated earnings to present worth, viz., 4 to 6 per cent.

(c) In the reduction of the whole amount of estimated earnings to present worth the common annuity method should be used rather than the sinking fund method.

(d) In the case of a mine or ore body which is valued as of a date prior to the beginning of production a proper discount should be introduced into the calculation of present worth, and the period of deferrence of beginning of operations should be fixed in each case by the tax payer subject to review by the commissioner of internal revenue.

(e) In the determination of the estimated earnings per unit the estimated price or expected receipts for the ores of the several commercial grades should be based on the Lake Erie prices, so far as Lake Superior ores are concerned, considering the average prices over a period of years preceding the date to which the valuation refers.

In the determination of the cost of production no definite rule should be prescribed but there should be taken into account in the case of an operating property, its actual cost records over that same period of years for which prices are averaged. In the case of a property which has not been developed to the operating stage the expected costs may be properly based on the known costs of other similar properties under operation. In every case account should be taken of the peculiar circumstances and conditions of the property.

(g) In determining the cost of production there should be included a fair operator's profit, reckoned as a percentage of the total cost before adding the operator's profit.

(h) In the determination of the operating life or exhaustion period account should be taken of the marketability of the ore; that is, its quality, the total available quantity of the same grade in the Lake Superior region and the rate at which the total quantity is being exhausted by shipments.

APPORTIONMENT OF THE DEPLETION DEDUCTION TO LESSOR AND LESSEE: In discussing the basis of the computation of the depletion deduction it will be convenient to refer to the date as of which the cost or value of mineral property enters into the calculation as "the basic date." The basic date then will be March 1, 1913, in the case of property acquired prior thereto, date of acquisition in case of property acquired on or after March 1, 1913, and, in case of discovery of a mine, the date of discovery or any date within 30 days after discovery.

The following definitions embody our recommendations concerning the apportionment of the depletion deduction between lessor and lessee and between the owners of partial interests of any other character or characters in a mineral property:

(a) Cases where the basic date is March 1, 1913: In case the taxpayer is possessed of a full or a fractional interest in a freehold or a leasehold, or any other interest in a mineral property dating from March 1, 1913, or any time prior thereto, his allowable principal sum remaining for depletion at the beginning of the taxable year shall be the fair market value of his interest in the property as of March 1, 1913, not otherwise deductible, plus subsequent proper charges to capital account, not otherwise deductible, less the depletion which has or should have been deducted or accounted for to the beginning of the taxable year.

In case the interest of the taxpayer in such mineral property on March 1, 1913, was subject to a lease or other instrument by which such taxpayer had granted rights or privileges to another or others, for a period equivalent to or

exceeding the probable unexpired operating life of the property in consideration of payments to be made to such taxpayer as provided for under said lease or other instrument, then the depletable value of the interest of such taxpayer at the beginning of the taxable year shall be the present value as of March 1, 1913, of the anticipated payments to be received by him under such lease or other instrument less the depletion which has or should have been deducted or accounted for to the beginning of the taxable year.

Viewpoints Are Explained

But in case the unexpired term of such lease or other instrument was on March 1, 1913, shorter than the probable operating life of the property, the depletable value of the interest of such taxpayer at the beginning of the taxable year shall be the present value as of March 1, 1913, of the anticipated payments to be received by such taxpayer under such lease or other instrument plus the present value as of March 1, 1913, of the rights and privileges which it was anticipated on March 1, 1913, would be repossessed by such taxpayer at the termination or expiration of the lease or other instrument plus proper charges to capital account, not otherwise deductible, and less the depletion which has or should have been deducted or accounted for by such taxpayer to the beginning of the taxable year.

In case the taxpayer operates a mine under lease or other contract or agreement acquired on or prior to March 1, 1913, the depletable value of his interest in the mine at the beginning of the taxable year shall be, in the absence of other more conclusive evidence of its fair market value as of March 1, 1913, the present value as of March 1, 1913, of his prospective net earnings from operation of the mine, not otherwise deductible, plus proper charges to capital account subsequent to that date, not otherwise deductible, less the depletion which has, or which should have been deducted or accounted for by such taxpayer to the beginning of the taxable year.

(b) Cases where the basic date is subsequent to March 1, 1913: In case the interest of the taxpayer in a mineral property was acquired by him on or after March 1, 1913, the allowable principal sum remaining for depletion at the beginning of the taxable year, except in case of discovery of a mine on or after March 1, 1913 (as to which see the following paragraph) shall be the cost to such taxpayer of such interest, not otherwise deductible, plus proper charges to capital account after the date of acquisition, not otherwise deductible, less depletion which has or should have been deducted or accounted for by such taxpayer to the beginning of the taxable year.

In case of discovery of a mine by the taxpayer on or after March 1, 1913, the allowable principal sum remaining for depletion at the beginning of the taxable year shall be the value of the interest of such taxpayer in the discovered mine on the date of discovery or within 30 days thereafter, not otherwise deductible, plus subsequent proper charges to capital account, not otherwise deductible, less the depletion which has or should have been deducted or accounted for by such taxpayer to the beginning of the taxable year. In case two or more taxpayers have participated in the discovery of a mine, depletion may be deducted by each such taxpayer but only on the basis of the depletable value of his interest in the discovered mine.

With regard to payments to reserves to provide for accruing losses and liabilities, the operators approved an opinion of the committee on federal taxation of the National Tax association, and, regarding charges to capital account vs. charges to current expenses, stated:

We approve the principles stated in Article 222, Regulations 45. This article is a step in the right direction. It does away with the empiricism of the old rule that every expenditure for an item of physical property or other instrument having a useful life of more than one year must be capitalized. We believe that the time has come when the commissioner may safely make a further extension of the principle of Article 222. We believe that the judgment of the responsible managers of a mining enterprise, if reflected in good faith in the books of account, should, especially with respect to classification and treatment of expenditures, be accepted in the audit of tax returns. However desirable it may appear from an administrative point of view to simplify the audit to an application of uniform rules of accounting to all mining operations, we submit that expediency should give way to an actual recognition of the principle and fact that good business accounting must necessarily take account of the circumstances of the business. The law recognizes that good business accounting is proper tax accounting. We urge, therefore, that the classification of expenditures made in good faith and regularly entered on the books of account by the responsible managers of a mining business, should not be set aside summarily by the auditing officials of the bureau of internal revenue, but should be accepted and approved by them. The taxpayer should be permitted to be the judge of the requirements of his business. An auditing official should be the judge of the good faith of the taxpayer.

Munition Tax Applies to Shell Forgings

Washington, March 9.—The munitions tax act of 12½ per cent upon net profits is applicable to manufacturers making forgings to be finished by other makers into finished shells. Such a decision rendered by the Supreme Court of the United States on March 1 is far reaching in its importance. It affects steel producers throughout the country and will derive millions in revenue from them for the government. The munitions tax decision was made in three cases, which came to the supreme court on appeal, all of them involving the same principle, and each being given through Justice McKenna. The findings in each case affirmed those of the courts from which appeal was directly made.

The cases were those of the Worth Bros. Co., the Forged Steel Wheel Co., and the Carbon Steel Co., the first being directed against Ephraim Lederer, collector of internal revenue for the first district of Pennsylvania, while the latter two were directed against C. G. Llewellyn, collector of internal revenue for the twenty-third district of Pennsylvania. The Worth Bros. Co. sought to recover $74,857.07, the Forged Steel Wheel Co., $246,920.18 and the Carbon Steel Co., $271,062.62 exacted under the munitions tax act of Sept. 8, 1916, but were unsuccessful.

Former Employes Obtain Machinery Plant

Composed entirely of former employes of the Black & Decker Mfg. Co., which removed its operations from Baltimore to a suburb, Towson Heights, some time ago, the Dieffenbach-Westendorf Mfg. Co., has bought the former Black & Decker plant at Baltimore. President O. W. Dieffenbach, formerly was manager of the Baltimore plant and Vice President and General Manager William Westendorf, was superintendent. Treasurer George M. Kimberly has been treasurer of the Black & Decker company for a number of years, a position which he still holds. The secretary of the new company is John Sonnenleiter, foreman of the milling machine department. Directors include the first three officers with Albert Fankhanel, John Sonnenleiter, Alonzo G. Decker and S. Duncan Black and numbered among the stockholders are practically all of the older employes of the Black & Decker organization.

The Dieffenbach-Westendorf company is equipped for the manufacture of special machinery. It is devoting a large portion of its capacity to the overflow from the Black & Decker plant at Towson Heights. The latter company will discontinue the special machinery line and devote its energies to the manufacture of portable electric drills, valve grinders, electroflaters and a new device for indicating the amount of load or overload a truck is carrying. It plans to erect another plant, duplicating the size of the present one incorporating new manufacturing methods, starting the manufacture of new lines, erecting a cafeteria and building 25 more houses for employes. A building and loan association is being considered to assist employes to own their own homes.

Steel Exports Show Improvement

January Tonnage Almost Recuperates After a Sharp Decline Made in December —Imports Also Recover and Reach Highest Point Since April, 1917— Pig Iron Is Responsible for the Gains

AFTER showing a severe setback in December, exports and imports of iron and steel during January made a marked improvement, exports practically regaining the loss of the previous month and imports setting a new figure, the highest since April, 1917. Improvement in imports was a natural result due to the low rate of exchange which prevailed in January but the tonnage of exports probably would have been decreased had exchange been the sole factor.

IMPORTS AND EXPORTS
(Gross Tons)

1917—		
January	40,910	608,281
February	24,947	449,099
March	37,943	606,559
April	48,213	519,397
May	26,479	582,303
June	29,080	629,305
July	28,859	346,393
August	26,129	503,075
September	19,058	499,067
October	14,310	571,868
November	13,995	473,549
December	14,642	653,344
Total	324,565	6,442,240
1918—		
January	12,475	490,259
February	12,941	438,848
March	14,345	379,924
April	11,371	462,887
May	14,387	488,515
June	13,913	418,605
July	11,511	452,759
August	12,520	512,104
September	8,440	473,688
October	15,744	426,767
November	11,582	471,427
December	28,996	356,641
Total	168,225	5,372,424
1919—		
January	16,913	371,570
February	12,302	344,180
March	17,632	367,224
April	16,566	396,813
May	17,885	422,282
June	21,056	561,020
July	28,258	287,685
August	28,987	396,743
September	43,567	363,531
October	40,698	302,459
November	43,826	336,994
December	39,806	254,780
Total	327,490	4,405,281
1920—		
January	45,795	333,677

Greater production in both pig iron and steel during the month may be assigned as one cause for the improvement while the movement of much material which had accumulated in the warehouses during the latter part of December may be assigned as another.

Exports for January totaled 333,677 gross tons compared with 254,780 tons during the previous month. This is a gain of 78,897 tons or 31 per cent. The rate of gain was greater than the rate of decrease of December over November when the drop was 24.4 per cent. Pig iron exports in January with 18,468 tons made an increase of 3856 tons over the 14,612 tons shipped in December or an increase of 26.3 per cent. Semifinished material, however, showed a slight loss, falling from 21,538 tons to 19,937 tons in January. This was a loss of 1601 tons or 8.04 per cent. Particularly large gains were made in steel rails, steel bars, structural iron and steel, and sheets and plates. Smaller gains were made in scrap, wire rods, ship and tank plates, wire nails, and pipes and fittings while other lines either held their own or showed small losses.

Iron and steel imports for January totaled 45,795 tons, an increase of 5989 tons or 15 per cent over the 39,806 tons shipped into this country during December. Although this total was only about 2000 tons higher than the total for November, it is the largest shipment since April, 1917, when 48,213 tons were imported. A gain of almost 200 per cent was shown in pig iron while scrap and semi-finished material showed slight losses. Other materials totaled about the same as during December.

Imports of iron ore made a large gain and almost equaled the tonnage received in November. The 88,881 tons in January was an improvement of 35,927 tons over the 52,954 tons in December. The gain was the result of greatly increased shipments from Cuba and a large tonnage from Sweden.

IRON AND STEEL EXPORTS
(Gross Tons)

	January		Seven months ending January	
	1920	1919	1920	1919
Pig iron	18,468	36,757	166,006	208,446
Scrap	4,234	632	26,583	1,184
Steel billets, ing. and blooms	19,037	11,594	170,416	815,344
Wire rods	8,822	15,653	55,356	88,996
Steel rails	44,449	64,989	316,375	306,153
Steel bars	43,767	29,318	318,974	280,029
Iron bars	1,796	10,332	19,307	49,128
Struc. iron and steel	27,550	30,248	166,817	149,482
Hoops, bands and scroll	3,746	7,619	21,857	31,435
Sheets and plates	95,438	92,528	523,951	541,124
Ship and tank plates, punched and shaped	3,932	467	11,725	14,095
Tin and terne plate	20,583	29,403	102,497	142,289
Barbed wire	5,887	4,257	63,038	157,360
All other wire	7,909	10,500	97,468	96,664
Cut nails	34	471	900	1,883
Wire nails	4,595	6,887	38,441	44,910
All other nails incl. tacks	554	2,120	5,188	8,930
Pipes and fit'gs.	17,329	10,746	137,327	78,634
R. R. spikes	738	1,567	9,407	6,221
Bolts, nuts, rivets and wash.	2,159	4,341	17,337	20,057
Horseshoes	68	158	1,654	952
Cast radiators	1,682	289	4,634	2,137
Total	333,677	370,876	2,275,258	3,045,453

IRON AND STEEL IMPORTS
(Gross Tons)

	January		Seven months ending January	
	1920	1919	1920	1919
Pig iron	23,955	1,852	98,561	14,926
Scrap	17,120	12,936	141,463	56,639
Bar iron	303	105	1,479	683
Ingots, blooms and billets	3,130	1,511	12,285	23,558
Structural shapes	169	26	754	1,911
Rails	754	435	6,276	6,343
Sheets and plates	177	67	771	396
Tin and terne plate	41	....	213	....
Tin scrap	....	....	....	....
Wire rods	146	....	405	1,929
Total	45,795	16,932	262,207	106,385

IMPORTS VARIOUS ORES AND FERROALLOYS
(Gross Tons)

	January		Seven months ending January	
	1920	1919	1920	1919
Ferromanganese	2,771	850	20,481	9,544
Ferrosilicon	1,431	830	10,115	5,160
Manganese ore	21,463	47,504	128,822	293,971
Tungsten-bearing ore	285	873	4,665	7,731
Nickel ore	2,583	4,397	14,244	35,867
Total	28,533	54,454	178,327	352,293

IRON ORE IMPORTS
(Gross Tons)

From	January		Seven months ending January	
	1920	1919	1920	1919
Spain	2,498	18,467	23,743	49,506
Sweden	6,366	....	38,925	....
Canada	611	4,184	4,652	90,981
Cuba	79,288	10,600	282,312	352,773
Other countries	118	....	16,464	1,287
Total	88,881	33,251	366,096	494,607

EXPORTS PIG IRON AND SEMI-FINISHED
(Gross Tons)

1917—		
January	69,146	183,656
February	49,018	131,566
March	69,629	193,469
April	44,783	162,209
May	61,112	168,158
June	83,406	190,907
July	32,305	106,085
August	62,083	170,503
September	44,287	148,932
October	47,115	209,667
November	25,733	150,120
December	67,593	203,085
Total	656,210	2,018,357
1918—		
January	20,581	195,385
February	10,540	173,272
March	9,849	144,443
April	11,282	177,128
May	22,567	159,299
June	22,896	139,377
July	20,265	139,612
August	26,028	189,851
September	34,494	135,450
October	35,452	125,023
November	30,825	150,024
December	24,577	63,890
Total	269,356	1,792,754
1919—		
January	36,757	11,594
February	20,840	10,407
March	22,158	8,176
April	17,038	11,488
May	37,087	20,771
June	39,758	46,016
July	42,327	21,318
August	36,071	26,162
September	18,991	37,513
October	14,108	20,713
November	21,429	13,211
December	14,612	21,538
Total	321,176	258,907
1920—		
January	18,468	19,937

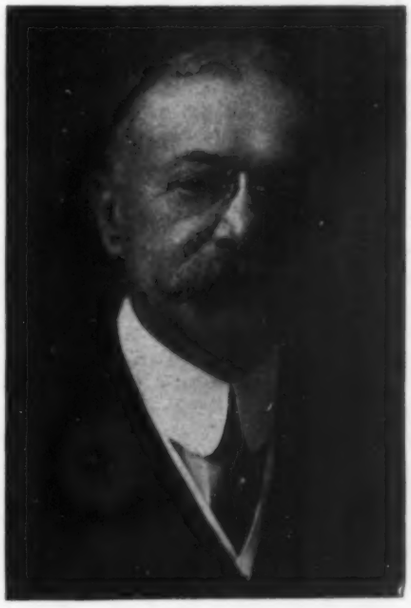
Obituaries

FRANK C. SMINK, aged 74, chairman of the board of directors of the Reading Iron Co., Reading, Pa., died from a complication of diseases March 3, at his home in that city. Until about one year ago he had served the Reading company as president since February, 1902, when he succeeded the late George F. Baer, upon the latter becoming president of the Philadelphia & Reading railroad. On March 15, 1919, Mr. Smink was elected chairman of the board, succeeding E. T. Statesbury. Leon E. Thomas then succeeded him as president. Mr. Smink's health had been failing for about a year but his condition became serious only a few days prior to his death.

Mr. Smink was born in 1845 in Kutztown, Berks county, Pennsylvania. He was educated in the public schools of Reading, graduating from the high school there in 1861. He then taught school during the winter season, and did farm work in the summer months. His first position in the business world was that of bookkeeper in the shoe manufacturing establishment of H. F. Felix, with which he remained two years. In 1864, he entered the employ of the Philadelphia & Reading railroad as secretary to Superintendent G. A. Nicolls. Later he resigned to take a clerical position in Bushong Bros.' bank and soon afterward was promoted to cashier. He served in that capacity until 1877, when the bank failed. Some time previously, he had become treasurer of the Berks & Lehigh railroad, which also suspended business in 1877. The following year, he became business manager for the Reading Iron Works, remaining in that capacity until the Reading Iron Co. was organized in 1889. With that organization Mr. Smink had much to do and was elected treasurer. Later he was elected vice president and general manager and in 1902, became president. Under his administration, the Reading Iron Co. grew to be one of the largest manufacturers of wrought iron pipe in the world.

Mr. Smink became one of the captains of Pennsylvania's iron and steel industry. Besides his executive positions with the Reading Iron Co., he was a director of the Temple Iron Co., and the Reading Trust Co. For many years he had served as a member of the executive committee and a director of the Pennsylvania Steel Co., Spanish-American Iron Co., Maryland Steel Co., Penn-Mary Coal Co., Pure Oil Co., and other organizations, including the Cornwall & Lebanon railroad and the Schuylkill & Lehigh railroad, as well as many iron and mining companies of lesser magnitude. He was a member of the American Iron and Steel institute, American Institute of Mining Engineers and various other clubs and organizations.

T. B. Walker, at one time superintendent of the Union Iron Works,



FRANK C. SMINK

Buffalo, died March 2, in Clinton, N. Y., and was buried in Cincinnati.

William H. Falkenstein, 56, superintendent of the Railway Steel Spring Co., Pittsburgh, died in Pittsburgh, March 2.

Antone T. Langelier, founder of the Langelier Mfg. Co., Providence, R. I., died recently at his home. He had been in the machinery manufacturing business for over 30 years.

John N. Woodfin, president of the Lincoln Iron Works, Rutland, Vt., died at his home recently. He also was a director of the American Type Founders Co., New York.

E. Clinton Smith, for 51 years associated with the J. L. Mott Iron Works, died unexpectedly Feb. 27, at his home in Elizabeth, N. J., aged 67. During his career, he arose from office assistant to sales manager.

M. Knecht, a leading iron manufacturer in Nancy, France, is dead at his home there. His son, Dr. Marcel Knecht, recently returned to France after serving in the United States as the head of the French official bureau of information.

Harry B. Whall, for several years Boston representative of the New England Steel Castings Co., East Longmeadow, Mass., died at his home in Dorchester, Mass., Feb. 27, from double pneumonia, aged 51 years. He served two terms in the Massachusetts legislature.

Thomas W. Burnham, 75, president of the Kilby Mfg. Co., of Cleveland, died, March 2, at Pasadena, Cal., where he was spending the winter. The body will be brought to Cleveland for burial. Mr. Burnham was a graduate of Union college, Schenectady, N. Y., and a director of several Cleveland banks.

Thomas J. Stewart, mechanical superintendent and traveling representative of the James Stewart Mfg. Co., Woodstock, Ont., stove and furnace manufacturer, died on March 1, at the age of 76. He was a son of the late James Stewart who founded the business in Hamilton, Ont., in 1845.

James J. Flannery, 66, a brother of the late Joseph M. Flannery, who died Feb. 18, with whom he had been closely associated in various business enterprises, died at his home in Pittsburgh on March 6. Mr. Flannery joined with his brother in the formation of the American Vanadium Co., recently sold to Charles M. Schwab and J. Leonard Replogle, and now is part of the Vanadium Corp. of America. He had been in poor health for some time, but the recent death of his brother is believed to have hastened his death. He was born in Hollidays Cove, W. Va., coming to Pittsburgh with his parents when a small boy. He was connected with the Standard Chemical Co., the Radium Chemical Co., the Standard Alloys Co., the Flannery Bolt Co., the Keystone Nut Lock Mfg. Co., the Vanadium Metals Co., the Wharton Steel Co., the Collier Land Co. and the Montour & Lake Erie Coal Co., as a director or official. He always took an active part in charitable and philanthropic work and played a prominent part in the Red Cross and other war work activities.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

OCCUPYING the same location in Pottstown, Pa., for 35 years and one in another part of town for the previous five years, Sotter Bros., Inc., manufacturer of steam boilers, now is erecting an additional plant, 140 x 140 feet. This will have a brick base 6 feet high, the remainder of the sides being of wired glass and steel frame construction. One 25-ton crane with 55-foot span and two 10-ton cranes with 35-foot spans will be purchased. New machinery requirements will include a set of rolls for bending pipe as small as 12 inches in diameter; the rolls to have at least 10 feet between housings and to be quickly operated; one bevel shears; a horizontal punch; an angle bending machine; a riveter with a 6 or 7-foot reach and with the bottom stake of such diameter as to permit the riveting of the 12-inch diameter stacks or pipe. The machinery in the new department will be electrically operated. The company also states it will install a new air compressor of 500 or 800 cubic foot capacity with an electric motor. A number of small tools, such as reamers and drills, both wall and radial probably will be required as will oil furnaces for rivet heating and annealing furnaces for tools. Narrow gage industrial tracks with frogs and turntables may be required as well. These contemplated improvements will double the company's capacity.

* * *

NOW under erection, the new plant of the A. P. Harder Furnace Co., 158 Morgan street, Rockford, Ill., is 60 x 400 feet. It is to be equipped with all modern machinery and be ready for use by April 1.

* * *

WITHIN a year, the Hoover Suction Sweeper Co., North Canton, O., will construct a factory in Canton, O., which will employ 1500 workmen. The company has purchased the plant of the Ohio Sheet Metal Co.

* * *

DUE to lack of funds, the Joliette Electric Steel Co., Joliette, Que., which recently obtained a charter, was unable to buy out the Joliette Steel Co., Ltd., that city, the purpose for which it was incorporated. It is in existence no longer.

* * *

THE third open-hearth furnace was placed in operation recently at the new Sharon, Pa., plant of the National Malleable Castings Co. Two electric furnaces now are operating in the old plant of the company and two others have been started in the new plant.

* * *

NEW and up-to-date foundry equipment will be installed by the Industrial Foundry Co., St. Johns, Mich., manufacturer of gray iron castings, wood and metal patterns. The addition will triple the company's capacity.

* * *

UNDER construction for the past six months, the slag crushing plant of the Struthers Furnace Co., Youngstown, O., recently underwent a successful trial operation. Regular operation was scheduled to start over a week ago. The plant will have a 24-hour capacity of 450 tons of slag.

* * *

A COMPLETE line of woodworking machinery of latest types has been installed by the Rowe Motor Mfg. Co., Lancaster, Pa., in its new addition, 100 x 120 feet. This gives it a total floor space of 24,000 square feet and equips it to manufacture commercial and pleasure car bodies in addition to worm driven motor trucks.

* * *

THE Pullman Co., Pullman, Ill., manufacturer of railroad cars, which took on the building of automobile bodies for the Packard Motor Car Co. several months ago, as a fill-in, has decided to make this a permanent branch of its business, and additions have been made to the plant to accommodate it.

* * *

REPRESENTING Detroit and Cleveland interests, Charles T. Miller has purchased the plant of the Lincoln Stove Co., Fremont, O. The Fremont Foundry Co. is to be formed to occupy the plant for the purpose of producing castings for automobiles and trucks. Approximately $40,000 will be expended for new equipment, etc. The Lincoln Stove Co. will continue its business in Fremont.

* * *

AT A reorganization meeting of the Pullman Co., Pullman, Ill., Robert T. Lincoln was again made chairman of board of directors, and John S. Runnells president of the company. L. S. Hungerford and L. S. Taylor, federal managers, were made vice president and general manager and vice president and controller, respectively.

* * *

BECAUSE its business has expanded so much during the past few years, the American Nut & Bolt Fastener Co., Pittsburgh, has found it necessary to erect an addition, 50 x 100 feet. This will be used for a stock room and is but the first step in its building plans, since additional structures will be erected as necessity requires.

* * *

THE entire stock of apparatus and accessories of the F. D. Harger Co., Buffalo, has been purchased by the Mono Corp. of America, 48 Coal and Iron Exchange, that city. F. D. Harger, mechanical engineer, has not severed his connection but will serve as general manager of the new corporation. A service and inspection department, connected with the laboratory, now is in operation.

* * *

AS A selling organization, the Winer-Hodge Corp., 5 Columbus Circle, New York City, will represent the following manufacturers in the eastern states, selling only to jobbers: The United & Globe Rubber Co., Trenton, N. J.; International Metal Mfg. Co., and the Manning J. Smith Belting Co., Philadelphia; Premier Motor Products Co., and the Motor Support Co., Chicago; Jambor Mfg. Co., Milwaukee; Autoquip Mfg. Co., Rochester, N. Y.; Akron-Selle Co., Akron, O.; Tungsten Mfg. Co., Marshalltown, Iowa. The corporation does not intend to build a plant or carry any stock. Its capital is $25,000 and its officers are as follows: President, Philip H. Winer; vice president, L. V. Longhurst; secretary and treasurer, Alvin R. Hodge.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

WITH its reorganization completed, the Wickwire-Spencer Steel Corp., Buffalo and Worcester, Mass., formerly the Wickwire Steel Co., and the Clinton Wright Wire Co., has elected the following officers: President, T. H. Wickwire Jr., Buffalo; vice presidents, George M. Thompson, John A. Denholm and George F. Wright, all of Worcester, and Ward A. Wickwire, Buffalo; chairman of the board of directors, Harry W. Goddard, Worcester; treasurer, Frank Kilmer, Grafton, Mass.; directors, the foregoing officers and Fank A. Drury, Paul B. Morgan and George M. Wright, all of Worcester; George F. Naphen, New York; L. W. Robinson, president of the Rochester & Pittsburgh Coal & Iron Co.; T. H. Wickwire, formerly president of the Wickwire Steel Co., Buffalo, and R. B. Young, vice president of E. H. Rollins & Sons, Boston, bankers.

Other minor officials will be appointed by the directors, among whom no changes are anticipated. All formalities which terminate the existence of the Clinton-Wright Wire Co., and the Wickwire Steel Co., have been completed, the two corporations being merged in New York state. The Clinton-Wright Wire Co. is calling in its preferred shares now outstanding amounting at the aggregate par value to $3,500,000 for redemption April 1, at the office of the Guaranty Trust Co., New York, at the rate of $110 and accrued dividends to that date for each share.

* * *

NEGOTIATIONS now are under way with the town of Peterboro, Ont., and upon their successful outcome depend the proposed extensions to the Peterboro plant of the Canadian General Electric Co., Ltd., Toronto, Ont. The company hopes to make extensive improvements and increase its facilities for manufacturing electric apparatus, supplies and automotive equipment.

* * *

STEEL companies who recently have acquired license agreements for the use of roof construction for open-hearth furnaces, invented by Frank Orth, Indiana Harbor, include the following: The Kokomo Steel & Wire Co., McKinney Steel Co., Republic Iron & Steel Co., Allegenhy Steel Co., Scullin Steel Co., Pittsburgh Steel Co., Buckeye Steel Casting Co., Reading Steel Casting Co. and the Whitaker-Glessner Co.

* * *

THE Koppel Car Repair Co. is the name of a recently organized subsidiary of the Koppel Industrial Car & Equipment Co., Koppel, Pa. The new company has a shop located on the property of the parent organization and already is turning out four repaired cars a day, with capacity for dismantling and getting ready for repair about 30 cars at one time. The company is getting much business from western Pennsylvania railroad systems.

* * *

COMPLETELY reorganized the Lloyd-Thomas Co., Chicago, appraiser and engineer, now has a greatly enlarged staff to care for increased business. The new officers are: President, Clifford B. Ross; vice presidents, W. Frank Saunders, Charles E. Shearer and Alfred C. Schauer; secretary and treasurer, John J. Thomas, general manager, Frank B. Schauer; production manager, Henry B. Anthony, and assistant treasurer, J. F. Raible.

* * *

FOR the purpose of manufacturing soil pipe and fittings, the Emporium Pipe & Foundry Works, Emporium, Pa., has been incorporated at $75,000. It has purchased the plant of the defunct Independent Foundry Co., and has installed electric power and modern equipment. Practically all of the latter has been purchased. Officers are: President, C. J. Goodnough; vice president, C. W. Rishell; secretary, Jay P. Felt, and treasurer, John Schwab.

* * *

OPERATIONS are expected to be started in about 30 days in the new plant of the Lookout Boiler & Mfg. Co., Chattanooga, Tenn., which is rapidly nearing completion. The company, which was incorporated some time ago with $100,000 capital, will manufacture boilers, tanks and a general line of plate and sheet metal work. Officers are: President, H. H. Peek; vice president, John Stagmaier; treasurer, James M. Wester, and secretary, L. G. Hicks.

* * *

TO ENGAGE in consulting work on the metallurgy of iron, steel, ferroalloys and ore reduction processes; the heat treatment of steel and steel improvement; the design, construction and operation of electric furnaces, R. C. Gosrow has established an office at 701 Claus Spreckels building, San Francisco, as a metallurgical engineer and electrometallurgist. He is western representative for the Pittsburgh Furnace Co., Milwaukee, manufacturer of electric iron, steel and nonferrous melting furnaces.

* * *

THE John Eichleay Jr. Co., Pittsburgh, soon will begin the construction of a modern boatyard at Hays, Pa. This is located on some of the land of the old plant of the Monongahela Iron & Steel Co., taken over by the Eichleay company when the former concentrated its works at Paden City, W. Va. The Eichleay company, which recently secured the contract for a steamboat for the Mississippi river trade, also has obtained the contract for 20 timber barges for the Old Reliable Towing Co.

* * *

UNDER the direction of Beecroft & Partners, Staffordshire, England, an office has been opened at Credland Chambers, 111 Queen street, Sheffield, England, for the American Metallurgical Corp., Philadelphia. The title of this foreign headquarters will be the Midland Metallurgical, Ltd., and G. C. Castle will be directly in charge. Work similar to that carried on by the American Metallurgical Corp., will be done abroad. The parent company recently received a contract from the United States Asbestos Co., Lancaster, Pa., with works at Manheim, Pa., for the design and installation of an automatic electric vulcanizing equipment. Heating elements will be of the General Electric Co. type; the oven body will be built by Young Bros., Detroit, but the American corporation will assemble and completely install all of the equipment.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

CAPITALIZED at $1,000,000, the Merchants Metals Corp., now being incorporated, has temporary offices at 347 Madison avenue, New York. Subsequent to May 1, it will be located in the Woolworth building. It is engaging in a general trading, jobbing, salvaging, wrecking and liquidating business and with it are identified several men who are prominent in the trade. Theodore Freideberg, president of the Manhattan Machinery Exchange, New York; Charles G. A. Pfitsch, manager of the International Bureau of Supplies, New York; Walter B. Eichleay and Ralph D. Young of the John Eichleay Jr. Co., Pittsburgh; Joseph G. Hitner, president. Henry Hitner's Sons Co., Philadelphia; Carl R. Briggs, president, Briggs & Turivas, Inc., Chicago, are financially and actively interested in the new enterprise. E. D. Baker, formerly purchasing agent of the American Steel Export Co., New York, has been appointed general manager.

* * *

ARRANGEMENTS have been made between the Courtney-Fraser Co., of New York, and the Charles C. Kawin Co., Chicago, whereby the laboratory of the former at Akron, O., will be operated as a branch of the Charles C. Kawin Co. The Courtney-Fraser Co. has arranged to have the business of its laboratory at Buffalo cared for at the Buffalo laboratory of the Charles C. Kawin Co. Both Mr. Courtney and Mr. Fraser have retired from all connection with the company.

* * *

MACHINE and pattern shops and foundry of the Crawford & McCrimmon Co., Brazil, Ind., have been purchased by The G. & R. Foundry & Machinery Co., Terre Haute, Ind. This purchase gives the latter company increased facilities to handle its growing business and enables it to manufacture brass or bronze castings and gray iron castings weighing up to 20,000 pounds. The Brazil plant will be operated under the name of the Crawford & McCrimmon Co. Officers have been elected as follows: President, Sam T. Greenberg; vice president, Frank H. Reynolds; secretary, Charles Hays; and treasurer, H. Stevenson.

* * *

REORGANIZATION of the Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., just effected, includes election of Alfred K. Barker, late of W. R. Grace & Co., New York, president and in charge of sales; Elvin C. Fry, treasurer; Edward C. Smith, vice president and general superintendent; Norman W. Cassell, secretary and in charge of purchases. D. E. Tracy, president, and W. T. Hildrup Jr., general manager, resigned their offices but with W. P. Starkey, continue as directors.

* * *

AT THE annual meeting of the Bucyrus Co., South Milwaukee, Wis., held recently, the following officers and directors were elected: W. W. Coleman, president; E. K. Swigart, W. F. Russell, vice presidents; G. A. Morrison, secretary; D. P. Eells, treasurer; Mitchell D. Follansbee, counsel; F. H. Bacon, J. H. Tweedy, Milwaukee; H. H. Dean, Andrew Fletcher, A. H. Lockett, W. H. Marshall, D. E. Pomeroy, J. B. Terbell, New York, and E. H. Steedman, St. Louis.

* * *

FOR the purpose of conducting a general engineering business in the design and construction of water works, pumping and power plants, water purification and sewage disposal plants, sewer and drainage systems, and buildings, J. W. Frazier, J. W. Ellms and R. E. Sheal have incorporated the Frazier-Ellms-Sheal Co., with offices in the Illuminating building, Cleveland. The company also will conduct engineering investigations, compile reports and make appraisals. The active members of the company have been engaged in consultign engineering work for many years.

* * *

AFTER making its first shipment in August, 1919, the Cleveland Automobile Co., Cleveland, produced 2500 cars by Jan. 1, 1920. It now has increased its production to 300 cars weekly and intends to increase its production to 3500 monthly or 40,000 cars a year before long. This is predicted by President J. V. Whitbeck on the company's continued ability to obtain material. The addition to the plant at London road and Euclid avenue is expected to be completed by April 1. This will provide a 4-story building, 80 x 800 feet.

* * *

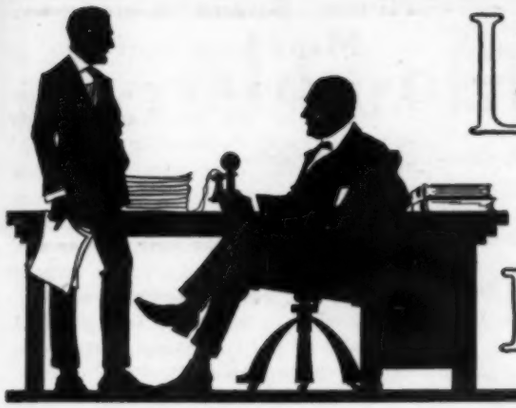
PURCHASED at a cost of $8000, property of the Greenville Iron Works, Greenville, S. C., is being improved extensively. A 2-story machine shop, the upper floor of which is to contain the patternmaking and woodworking departments, is being erected. This building will be 50 x 120 feet of standard construction and will house approximately $30,000 worth of machinery and machine tools. A 75 x 140-foot foundry also is being erected together with charging room, sand bins, cleaning room, storage sheds, etc. It will be served by a 300-foot railroad siding.

* * *

ADDITIONS to the plant of the Kewanee Boiler Co., Kewanee, Ill., now under way, consist of a boiler shop addition, 130 x 750 feet, and a foundry addition, 80 x 390 feet. This will increase the company's boiler shop capacity about 50 per cent. The contract is being handled by Warden & Allen, Milwaukee, who expect to complete the work about June 15. Practically all of the equipment needed has been arranged for and some of it already is on the ground awaiting partial completion of the building so that it can be installed.

* * *

FOR the purpose of manufacturing poppet valves for automobiles, the Perfection Parts Mfg. Co., has been incorporated for $100,000 and will be located at Cleveland. R. H. Reiter, secretary of the Perfection Piston Ring Co., Ravenna, O., is president and treasurer of the new company. Arthur Wolf, secretary and manager of the Perfection Parts company, has been connected with the automotive industry for many years. Vice President A. J. Jones also is interested in the Perfection Piston Ring Co. The new company already has arranged for the entire output of the coming year.



Little Stories of Business Life

Putting Teeth in Iron Trade

IF YOU should see a mining man from Duluth wearing as a watch charm a dark brown tooth filled with iron ore do not infer that he is a member of a strange new secret order. Such charms should be fashionable and quite appropriate to the apparel of any man from the Lake Superior iron ore district, since they are finding shark's teeth in the Oliver Iron Mining Co.'s Canisteo mine at Coleraine, Minn.

"Now we know why there are so many 'sharks' in the iron ore trade," said a furnace man when he heard of the discovery of shark's teeth in the mine. "Birds of a feather——."

A peculiar feature of the teeth, which have been identified by geologists as those of Saurians, or prehistoric marine reptiles, is that the iron ore has entirely replaced the bony parts of them and has become deposited firmly in the enamel shell as if by electrolytic action. Many such teeth, and also the bones of the Saurians have been picked up in the Canisteo mine.

"The shales which carry these fossils are often nothing but a worked over bed of the iron ore and are so rich in iron that they got into the market with the main iron ore body," observes a well known geologist.

And, carrying out the inference, we may have pig iron with a percentage of shark's teeth, possibly to be identified as such a specific grade, if many more teeth are found. And, if the mixture should prove deleterous, then we might have such trade slogans as "Smith's boneless pig iron," or "Johnson's toothless foundry iron."

Ferrets in Steel Making

THE important steelmaking firm of Brown Bayleys Steelworks Ltd., Sheffield, has a society called "The Ferrets" which recently held its annual dinner at the Grand hotel, Sheffield. Sir Robert Armitage, M. P., one of the principals, explained that the object of the association was to get to the bottom of things, in order to overcome the intricacies of the work on which they were engaged. It was their duty to know everything regarding the trade in which they were engaged instead of being satisfied with a knowledge of their own particular line. They must take an interest in the materials used, from the place they were obtained to the place where they were manufactured, and the various processes which had to be gone through in arriving at the finished article. He hoped the "Ferrets Society" would get a greater and wider grip of the whole of the steel industry, not only on the technical side but also on the practical side so that they would be able to overcome all difficulties in the sphere where they earned their daily bread. It was necessary to do more work, and that could be best achieved by introducing the latest machinery into the workshop and by the scrapping of obsolete tools, he said.

The "Nutless" Ship

RECENTLY launched at Seattle, the steel steamer CLAUSEUS, thirty-ninth hull built by the Northwest Steel Co., is known to its builders as "the ship without a nut." It has been constructed throughout with the use of a new nutless bolt invented and recently patented by John McPhee, superintendent of the company's riveting department and William Hackett, formerly boat foreman.

The device consists of three parts; first a pin or bolt, or a common rivet with a slot or shoulder on opposite sides, over which is slipped part two, a washer shaped like a key hole. The lengthened slot in the washer engages the shoulder of the bolt and locks. The third part, a wedge slotted throughout its length to accommodate the thickness of the bolt, then is slipped between the washer and the plate and driven home with a few taps of the hammer.

Cast Shot for Perry

WHEN the Weirton Steel Co., was erecting its blast furnaces and steel plant at Weirton, W. Va., workmen discovered a small iron furnace which is claimed to have been the first this side of the Allegheny mountains. This furnace is located on the Tarr farm in Hancock county, W. Va., opposite Steubenville, O., and it is stated by old settlers that cannon balls used by Commodore Perry in the battle of Lake Erie, were made from iron melted in it. The furnace was built by Peter Tarr, one of Hancock county's pioneer settlers. He made the cannon balls from ore deposits found in the hillsides about the furnace, packed them on mules and sent them overland to Perry. History reveals that they arrived in time.

Whipped Cream Runs Engine

SO LONG as the supply of olive oil, melted butter or whipped cream holds out, users of engines need not want for fuel. At the fortieth annual meeting of the American Society of Mechanical Engineers, E. W. Blakely reported that R. M. Hvid of Chicago, had invented an engine which was run by the use of these products. The experiment was witnessed by five engineers representing the Russian government. The engine was started and was kept running for a length of time on the following fuels: Crude oil, fuel oil, kerosene, olive oil, castor oil, melted butter, axle grease and finally whipped cream. Mr. Blakely said: "This engine has not yet been entirely perfected for high speed purposes, but it is applicable to motor boats, tractors and pumps."

King Midas Again

IF SOME remarkable predictions made by Frederick Soddy, professor of physical chemistry at Oxford university,

London, England, come true, the age long alchemists' dream of turning iron and other base metals into gold, will come true. Professor Soddy, who is well known for his research into the nature of elements and particularly into radium and its cognates, has published a volume giving the results of recent experiments.

Professor Soddy has much to say of queer elements and strange atoms anent the alchemists dreams. There was nothing extravagant in them, he says. The elements can be transmitted into one another, or could be if the atoms in them could be varied.

"To get gold from mercury," he explains, "expel from the atom of mercury one beta particle which will make thallium, then one alpha particle which will turn thallium into gold; or to get gold from lead expel from one atom of lead, one alpha particle, which will turn into mercury, and proceed as before."

New England Furnaces in New Iron Corporation

The Salisbury Iron Corp. has been incorporated under the laws of Delaware with an authorized capitalization of $500,000 of 6 per cent preferred stock and 20,000 shares of no par value common stock to succeed to the business and property of the Barnum-Richardson Co., Lime Rock, Conn., manufacturers of warm blast charcoal pig iron. The latter company has been the owner and operator of one furnace at Lime Rock, Conn., and two at East Caanan, Conn. The former stack has had a very historic career, having been built originally in 1734 and its product was used extensively for the making of ordnance used by the American forces in the revolutionary war. The present capacity of the furnaces is about 10,000 tons annually. The company has iron ore mines at Salisbury, Conn., and has other ore holdings in Connecticut and New York state. It has limestone lands and quarries at Lime Rock and East Caanan and a foundry at Lime Rock.

The Salisbury Iron Corp., the new owners will extend the foundry operations for the manufacture of chilled castings of charcoal iron including industrial and railroad car wheels. The new corporation has authorized the issuance of $200,000 of secured 7 per cent notes of which $50,000 will be issued at this time to provide additional working capital. The officers and directors of the Salisbury corporation are: Horace W. Davis, of New York, chairman; William McIntyre of Lime Rock,, president; Andrew Fulkerson, treasurer, and Messrs. Davis and McIntyre, Robert Scoville of Lime Rock, Conn., and New York; William H. Barnum, New York; Edwin A. Potter Jr., vice president, Guaranty Trust Co., New York; E. J. Boote of Finance and Trading Corp., New York; Eugene E. Anderson, Sharon, Pa.; Harry B. McDowell, vice president, McDowell National bank, Sharon, Pa., and Wilbur L. Ball, of Rosenberg & Ball, New York, directors.

National Acme Expands

Plans have been prepared for an addition to the plant of the National Acme Co., Cleveland, which will cover a little over two acres. Actual construction will start about the middle of April, according to an announcement by President A. W. Henn. When completed, this addition will give the National Acme company 10 acres under one roof and the improvement with equipment will cost approximately $500.000. The addition will increase the floor space of this plant about 33 per cent.

Ore Booklets Issued

Recent booklets containing analsyes of Lake Superior iron ores issued by the leading operators include those from M. A. Hanna & Co., and Oglebay-Norton & Co. In addition to the analyses, the Hanna booklet contains much useful information relating to rail and vessel freight rates, shipments and production statistics, average analyses of Lake Superior ores since 1902, and some statistics on pig iron production and opening and closing dates of navigation.

Call Institute Meeting

The spring meeting of the American Iron and Steel institute this year will be held Friday, May 28, at the Hotel Commodore, New York. There will be an all-day program, as usual, followed by the annual banquet in the evening. It is expected that the program, and the list of speakers, will be announced about May 1.

The increased demand for farm tractors and horse-drawn farming implements has made it necessary for the Oliver Chilled Plow Works, South Bend, Ind., to expand by the erection of a new plant at South Bend.

Home Roads Close for Many Locomotives

Striking evidence of the expansion of buying by the American railroads in recent weeks is found in the annual report of the American Locomotive Co., which points out that of new business totaling $12,800,000 accepted since the first of the year 84 per cent has been for domestic roads and 16 per cent for foreign account, as compared with 73 per cent foreign business and 27 per cent domestic business on the books Dec. 31, 1919.

As a result of suspended buying by the roads in 1919 the company operated but 29.2 per cent of capacity during the last six months. Earnings as a consequence suffered considerably during the last half of the year, the net amounting to $2,577,170 against $5,095,468 for the corresponding period one year before. For the 12 months the comparison is not unfavorable to the company. Although gross earnings dropped from $104,108,979 in 1918 to $70,073,582 in 1919, lower manufacturing expenses, depreciation, interest and taxes left larger net earnings in 1919. The comparative income account for the six months follows:

	1919	1918
Gross earnings	$20,630,083	$59,480,026
Operating expenses, etc.	17,532,188	50,986,284
Manufacturing profits	3,097,895	8,493,742
Interest	59,326	249,390
U. S. and Canadian taxes	461,399	3,148,884
Net earnings	9,494,369	7,037,354
Preferred dividends	875,000	875,000
Common dividends	750,000	625,000
Surplus for period	952,170	3,595,468
Reserve for betterments		1,000,000
Total surplus	952,170	2,595,468

Following is a comparison of the company's earnings for the calendar years 1919 and 1918:

	1919	1918
Gross earnings	$70,073,582	$104,108,970
Manufacturing expenses, etc.	58,115,820	91,493,555
Interest	228,189	450,984
U. S. and Canadian taxes	2,235,304	5,127,077
Net earnings	9,484,269	7,037,354
Preferred dividends	1,750,000	1,750,000
Net for common stock	7,744,269	5,287,354
Common dividends	1,375,000	1,250,000
Surplus for year	6,369,269	4,037,354
Reserve for betterments	4,000,000	2,000,000
Surplus	2,369,269	2,037,354

In his statement to stockholders, President Andrew Fletcher declared the return of the roads to private control, adjustment of their financial affairs, and revival of competition for business among them, should result in swelling the demand for economical and effective power. Although he believes some reports of the needs of the roads are exaggerations, prospects for immediate domestic business are assured by orders already received. Although the foreign demand continues large difficulties of financing it is cutting down the volume. During the year there was expended for permanent additions and betterments to the plants $1,747,835.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

WALTER R. HOWELL, who recently was elected vice president and general manager of Bliss & Laughlin, Inc., Harvey, Ill., manufacturer of steel products, began his career in the iron and steel business at the age of 14 as a wa'er boy in the mills of the Illinois Steel Co. After seven years' experience at the company's Milwaukee works in various capacities, Mr. Howell was placed in charge of bar schedules in the Chicago office. He later was promoted to chief clerk of the bar division and when he severed his connections with the Illinois Steel Co. to assume active management of Bliss & Laughlin, Inc., he was assistant to the manager of the order department. When the United States entered the war, Mr. Howell was sent to Washington by the Illinois Steel Co., where he assisted in the work of the American Iron and Steel institute, in gathering statistics and in allocating steel.

After three months, Mr. Howell enlisted, receiving a commission as first lieutenant in the procurement division of the ordnance department.

In August, 1918, Mr. Howell was ordered to Paris to assist in the purchase of miscellaneous steel supplies for the United States army in Europe. This order was superseded on his arrival in France by instructions to report to an artillery school to make a study of artillery material. After finishing the required course, Mr. Howell was placed in charge of an ordnance department shop, supervising the work of overhauling and repairing small arms and artillery pieces. After the signing of the armistice, he continued his duties in this branch of service, assisting also in the packing and crating of guns for shipment back to the United States. Returning to this country on March 1, 1919, Mr. Howell was honorably discharged from government service. He re-entered the employ of the Illinois Steel Co., and remained with it until he assumed active management of Bliss & Laughlin, Inc.

C. E. McKillips Jr., who recently became sales manager of Bliss & Laughlin, Inc., gained practical knowledge pertaining to the manufacture of iron and steel products in the employ of the Carnegie Steel Co. For two years he worked in various capacities in that company's open-hearth furnace, blast furnace, physical and chemical laboratories and rolling mills and then entered and remained with the Pittsburgh sales office for several months. He severed this connection to become affiliated with the sales force of the Cambria Steel Co., covering northwestern Pennsylvania and West Virginia. In 1915 he was transferred to the American Steel Export Co., New York City, then a subsidiary of the Cambria company and acted as salesman and buyer until he enlisted in government service in May, 1917.

Mr. McKillips received a commission as first lieutenant at one of the first officers' training camps. He was assigned to duty with the Seventy-ninth division, going overseas in July, 1918. After being wounded, he was sent back to the United States in January, 1919, and was honorably discharged from service in June of that year. He resumed his former position with the American Steel Export Co., which he retained until he entered the employ of Bliss & Laughlin, Inc.

Edward M. France, new general superintendent of Bliss & Laughlin, Inc., entered the employ of Lindeman & Hoverson Co., Milwaukee, as a boy. He became connected with various other manufacturing interests including Lutter & Gies, manufacturers of shapers and grinders, the Four Wheel Drive Truck Co., Milwaukee, the Stationers Loose Leaf Co., Milwaukee, and the Fitzsimmons Steel Products Co.

E. Wilson now represents the Western Crucible Steel Casting Co., Minneapolis, at Duluth with offices at 331 West First street.

Sidney H. McLane has been promoted from general superintendent to general manager of the Mobile Ship Building Co., Mobile, Ala.

Joseph P. Nelson has been appointed superintendent of the rolling mills of the Weirton Steel Co., Weirton, W. Va., of which Charles Elliott is general manager. When Mr. Nelson resigned as foreman of the steel plant of the Trumbull Steel Co., Warren, O., recently, he was presented with an engraved gold watch and silver set by associates.

J. A. Williams has resigned his connection with the Badenhausen Co., Philadelphia, and will conduct a business in his own name at 139 South Broad street, Philadelphia.

Donald Payne resigned recently as assistant production manager of the Aluminum Manufacturers, Inc., Cleveland, to become advertising manager for the Osborn Mfg. Co., that city.

Marcus Grossman, connected with the Westinghouse Electric & Mfg. Co., East Pittsburgh, has been appointed chief metallurgist of the Electric Alloy Steel Co., Youngstown, O.

John McConnell was elected vice president of the Interstate Iron & Steel Co., Chicago, at the recent annual meeting of the company. He succeeds Samuel Hale, resigned.

John E. Millea, formerly general manager of the Western Electric Co., in Cambridge, Mass., has accepted a position as professor of factory management with the Babson Institute, Wellesley Hills, Mass.

J. R. Dawson, formerly metallurgist with the American Steel & Wire Co., Worcester, Mass., recently was appointed instructor in the department of metallurgy, Lehigh university, Bethlehem, Pa.

Frank H. Gordon, general sales manager of the Lukens Steel Co., Coatesville, Pa., and Gustave T. Shants, Philadelphia district manager for that company, recently were elected directors of the Lukens Steel Co.

Lyman P. Hubbell of the Fillmore Avenue Foundry & Iron Works, Buffalo, was elected president of the Employers' association, that city, recently. Avery C. Wolf of the Jones Iron Works, was elected vice president.

James J. Zimmerman, formerly connected with the engineering department of the Cambria Steel Co., Johnstown, Pa., has been made assistant superintendent of the Scott foundry department of the Reading Iron & Steel Co., Reading, Pa., of which J. H. Brickly is superintendent.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

THOMAS J. DILLON, who recently was elected president of the Canada Foundries & Forgings, Ltd., Montreal, succeeding W. M. Weir, and who formerly was general manager, is a son of John T. Dillon, president of the Delaney Iron & Forge Co., Buffalo, a subsidiary company. He began as an apprentice at the Titusville Forge plant at Titusville, Pa., in 1896, and acquired a thorough knowledge of the work. In 1905 he located in Canada and organized the Canada Forge Co., of Welland, Ont., of which he was president. The company was merged with others under the present title in 1912 and Mr. Dillon became manager of the Welland plants. He was afterward appointed general manager of the whole organization which included the Smart Mfg. Co., Brockville, Ont. During the war the company was one of the first in Canada to demonstrate its ability to turn out shells of the kind required by the British war office.

James Rigby Jr., previously in the importing and exporting business, has become associated with the American Foundry Equipment Co., New York and Chicago, to take charge of sales in the New York office.

Franklin G. Smith, president of the Osborn Mfg. Co., Cleveland, operating for some time under the corporate style of the Cleveland-Osborn Mfg. Co., recently was elected a director of the Cleveland Trust Co., Cleveland.

W. A. N. Scott, for the past four years Connecticut representative of the Detroit Steel Products Co., has been appointed manager of the new Hartford, Conn., office of the Fougner Concrete Steel Co., New York.

W. H. Eshelman, superintendent of plate mills of the Brier Hill Steel Co., Youngstown, O., has resigned. His successor has not been named and his plans for the future have not matured. Formerly he was with the Republic Iron & Steel Co. and the Sharon Steel Hoop Co.

Louis Marshall Ream, formerly of the American Steel & Wire Co., in Worcester, Mass., who has been in France several months for the United States Steel Corp. is to return to this country shortly. On his return it is expected he will be transferred to the New York office of the corporation.

Emil F. Axner, who has been in charge of merchant pig iron sales for the Illinois Steel Co. at Chicago ever since the company began selling pig iron to foundries, has resigned and will engage in business on his own account. Mr. Axner entered the employment of the Illinois Steel Co.

EMIL F. AXNER

when a boy. After the Tennessee Coal, Iron & Railroad Co. was taken over by the United States Steel Corp. he handled sales of pig iron in the Chicago district for that company also.

Henry W. Wendt was elected president of the Buffalo Forge Co., Buffalo, succeeding William F. Wendt at a recent meeting of the company's stockholders. Other officers were elected as follows: Vice president and treasurer, Edgar F. Wendt; vice president and secretary, Henry W. Wendt Jr.; vice president and sales manager, C. A. Booth. Directors include above officers and H. S. Whiting.

E. S. Morris resigned as secretary and assistant treasurer of the Bayonne Bolt & Nut Co., Bayonne, N. J., recently to become connected with the L. C. Harry Co., 114 Liberty street, New York, heavy hardware, and also to become connected at the same address with the Cortada & Morris Co., Havana, Cuba, exporter. He had been with the Bayonne company for about 12 years.

J. W. Reed, former secretary and general purchasing agent of the Wisconsin Bridge & Iron Co., North Milwaukee, Wis., now is associated with George W. Smith and George Gibbs, in a new sales organization with offices in the First Wisconsin building, Milwaukee, for the handling of iron and steel products. Mr. Reed was purchasing agent for the Wisconsin Bridge & Iron Co. for the past 16 years.

J. D. Jones, who since September last, has been general superintendent of the Algoma Steel Corp., Ltd., Sault Ste Marie, Ont., has been appointed general manager to succeed the late Capt. David Kyle. Mr. Jones was in the service of the corporation from 1912 to 1916, but in the latter year went to Gary, Ind. to accept the position of chief engineer with the Indiana Steel Co. which he relinquished last fall to rejoin the staff of the Algoma corporation.

John C. Bradley, who for a number of years has been president of the Pratt & Letchworth Co., Buffalo, was elected chairman of the board of directors at the annual meeting held March 2. John H. Bradley, who has been general manager, was elected to the office of president and general manager; Franklin D. Locke, who has been vice president, was elected first vice president and John P. Williams, formerly manager of sales, was elected second vice president in charge of sales. Willis M. Edwards was re-elected secretary and treasurer.

John Joseph Coughlan now is the managing partner of the firm of J. Coughlan & Sons, Vancouver, structural steel manufacturers and shipbuilders the plans of which for a dry dock at Vancouver have been accepted by the Canadian government. During the war this company was active in shipbuilding and constructed a number of vessels both for the British government and foreign purchasers. Mr. Coughlan has been associated with the firm since 1902.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

ROGER N. HEALD, son of James N. Heald, treasurer and general manager of the Heald Machine Co., Worcester, Mass., was elected a director of the company at its annual meeting, March 2, increasing the board to five. These officers were elected: President, Paul B. Morgan; treasurer, James N. Heald; directors, these officers and John W. Harrington and Oliver B. Wood. Alonzo A. Whitcomb, superintendent, has been made temporary works manager to succeed Robert W. Ellingham, who resigned to go to the Van Norman Machine Tool Co., Springfield, Mass. H. C. Smith, formerly with the Hendee Mfg. Co., Springfield, Mass., has been promoted to superintendent until a permanent works manager is secured.

Dean S. Hazen has resigned as advertising manager of the National Acme Co., Cleveland, to enter the real estate publicity field.

William Gwilym has resigned as general foreman of the Waterville Machine Works, Waterbury, Conn., after four years' service.

M. R. Carson resigned as sales engineer of the Swind Machinery Co., to accept a position with the Monarch Machinery Co., 300 North Third street, Philadelphia.

F. A. Maxwell has charge of the new office in the Vulcan building, Cleveland, of the Co-Operative Machinery Co., formerly located in the Marion building.

William F. Hough has been made employment manager of the Goodell-Pratt Co., Greenfield, Mass., manufacturer of chucks, anvils, etc. He succeeds the late Luther Weissbrod.

Calvert Townley, assistant to president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, was re-elected vice president of the United Engineering society for the year ending January, 1921.

Duncan W. Fraser, managing director of the Montreal Locomotive Works, Ltd., has been elected vice president in charge of sales of the American Locomotive Co., and the Montreal Locomotive Works, Ltd, succeeding J. D. Sawyer, who has resigned to become vice president of Morton & Co., Inc., New York bankers.

Alfred B. Grout, office manager of the Woonsocket Machine & Press Co., Woonsocket, R. I., resigned to accept a position as assistant treasurer and manager of the Leader Weaving Co., Pawtucket, R. I.

Horace A. Brown Jr., identified with the Hyatt Roller Bearing Co., New York City, for 19 years, has been appointed manager of the motor bearings division with headquarters at Detroit.

P. J. Dasey has resigned as sales manager of the Blodgett Engineering & Tool Co., Detroit, to join the staff of the Midwest Engine Co., Indianapolis, engaged in research and sales engineering work.

Howard H. Payne, Pawtucket, R. I., has been appointed office manager and purchasing agent of the Woonsocket Machine & Press Co., Woonsocket, R. I., to fill the vacancy caused by the resignation of A. B. Grout.

E. Kennedy, formerly in the Chicago office of Manning, Maxwell & Moore, Inc., has been transferred to Buffalo to succeed the late F. C. Meyer as manager of the Buffalo office.

Roswell M. Rennie has been appointed superintendent of the machine shop in the department of mechanical engineering, University of Illinois, Urbana, Ill. Oscar William Schricker has been appointed as assistant to Mr. Rennie.

L. R. Mann has resigned his position as signal inspector for the Missouri Pacific railroad and has become sales engineer of the railroad department of the Central Electric Co., Chicago, with headquarters at St. Louis.

J. T. MacMurray, who formerly was works manager of the Mead-Morrison Mfg. Co., East Boston, Mass., recently became vice president and general manager of the Read Valve & Fittings Co., Reading, Pa. Alfred Spangenberg is superintendent of the latter plant. He formerly was superintendent of the ordnance department of the Mead-Morrison company.

Robert W. Ellingham, since June, 1918, works manager of the Heald Machine Co., Worcester, Mass., has resigned to accept a similar position with the Van Noorman Machine Tool Co., Springfield, Mass. Mr. Ellingham formerly was with the Bilton Machine Tool Co., Bridgeport, Conn.

John M. Fox has been appointed supervisor of equipment for the Black & Decker Mfg. Co., Towson Heights, Baltimore. In that capacity, he will have direct charge of machine tools, transmission, tool room and tool crib. J. F. Robbert has been made transportation manager in full charge of the transportation department.

J. George Leyner recently resigned as president of the J. George Leyner Engineering Works Co., Littleton, Colo. He now is devoting his entire time to the Leyner Tractor & Mfg. Co., 212 Tramway building, Denver, organized for manufacture and sale of a tractor, the design of which recently was improved by Mr. Leyner.

J. F. Bretz, chief chemist of the Bettendorf Co., Bettendorf, Iowa, manufacturer of steel cars and underframes, has resigned to accept a position in the South. W. O. Calvert, secretary of the company for many years, has resigned to accept a position with the Buffalo Steel Car Co.

Edward Wylde, head of the associated Elevator Supplies Co., New York, has been elected president of the Standard Plunger Elevator Co., Worcester, Mass., to succeed W. Herman Greul, who resigned Nov. 1. Mr. Wylde has been chairman of the board of directors, which position he will also retain. Other officers elected at the annual meeting, Feb. 11 were: Vice president and general manager, A. Bradley Burgess; treasurer, Lloyd G. Hagenbuch, the three constituting the board of directors. The Powell Planer Co., its subsidiary, elected A. M. Powell, president; Edward Wylde, vice president; Lloyd G. Hagenbuch, treasurer, and A. Bradley Burgess general manager, all but Mr. Bradley being directors.

Smaller Tax Total Is Predicted

Larger Number of Returns Will Result from Higher Average of Wages and Incomes, but Smaller Industrial Profits and Reduced Levies Will Lessen Revenues—Exchanges Recover on Reports of Gold Imports — Annual Reports of Companies

BY JOHN W. HILL, FINANCIAL EDITOR

ALTHOUGH close students of the tax situation expect to see on March 15 an unprecedented number of income and corporation returns made to the internal revenue department, they are predicting the aggregate of taxes, to be collected this year, will be vastly smaller than the $5,200,000,000 which the treasury department is anticipating. The rapid and widespread increase in wages and individual incomes in 1919 will swell the total of returns but owing to exemption privileges the taxes from this source will not be increased proportionately.

The greatest reduction in the sum of taxes will come from corporate earnings. In many lines of industry, last year saw profits reduced by a combination of influences, including business hesitation in the first part, and serious labor difficulties throughout the closing months. In the iron and steel industry this was particularly true. The annual reports that have been published by steel companies show on the whole much smaller profits compared with 1918 and, in those cases where the tax reservation is revealed, this item is seen to have undergone a tremendous shrinkage.

The head of one large tax accountant firm, which has prepared the returns of hundreds of companies says that the tax payments of these concerns will average 50 per cent less than one year ago. This is due to smaller earnings and to the fact that the tax schedules are reduced. The 1919 revenue act abolished the 80 per cent war tax provision of the 1917 law and reduced the excess profits rates for 1919 and subsequent years from 30 to 20 per cent in the first bracket, and from 65 to 40 per cent in the second bracket. As a result it is estimated that a concern with earnings equal to those for 1918 would have 33 per cent less taxes to pay.

Nevertheless, the drain on corporation funds will be sufficiently severe on March 15. The accumulation and borrowing of funds for meeting the tax installment is one of the causes of present tight credit situation.

Of widespread interest was the decision Monday by the Supreme Court stock dividends nontaxable. As a result of the ruling many income tax returns will have to be revised accordingly. Numerous iron and steel companies may now proceed with suspended plans for distribution of surpluses.

Internal Revenue Commissioner Roper

Corporation Tax Table Showing Total Nominal and Excess Profits Tax

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Per cent of income	Invested Capital 10,000,000	9,000,000	8,000,000	7,000,000	6,000,000	5,000,000	4,000,000	3,000,000	2,000,000	1,000,000	900,000	800,000	700,000	600,000	Per cent of income
10	135,260	121,660	108,060	94,460	80,860	67,260	53,660	40,060	26,460	12,860	11,500	10,140	8,780	7,420	10
15	275,260	247,660	220,060	192,460	164,860	137,260	109,660	82,060	54,460	26,860	24,100	21,340	18,580	15,820	15
20	415,260	373,660	332,060	290,460	248,860	207,260	165,660	124,060	82,460	40,860	36,700	32,540	28,380	24,220	20
25	645,260	580,660	516,060	451,460	386,860	322,260	257,660	193,060	128,460	63,860	57,400	50,940	44,480	38,020	25
30	875,260	787,660	700,060	612,460	524,860	437,260	349,660	262,060	174,460	86,860	78,100	69,340	60,580	51,820	30
35	1,105,260	994,660	884,060	773,460	662,860	552,260	441,660	331,060	220,460	109,860	98,800	87,740	76,680	65,620	35
40	1,335,260	1,201,660	1,068,060	934,460	800,860	667,260	533,660	400,060	266,460	132,860	119,500	106,140	92,780	79,420	40
45	1,565,260	1,408,660	1,252,060	1,095,460	938,860	782,260	625,660	469,060	312,460	155,860	140,200	124,540	108,880	93,220	45
50	1,795,260	1,615,660	1,436,060	1,256,460	1,076,860	897,260	717,660	538,060	358,460	178,860	160,900	142,940	124,980	107,020	50
55	2,025,260	1,822,660	1,620,060	1,417,460	1,214,860	1,012,260	809,660	607,060	404,460	201,860	181,600	161,340	141,080	120,820	55
60	2,255,260	2,029,660	1,804,060	1,578,460	1,352,860	1,127,260	901,660	676,060	450,460	224,860	202,300	179,740	157,180	134,620	60
65	2,485,260	2,236,660	1,988,060	1,739,460	1,490,860	1,242,260	993,660	745,060	496,460	247,860	223,000	198,140	173,280	148,420	65
70	2,715,260	2,443,660	2,172,060	1,900,460	1,628,860	1,357,260	1,085,660	814,060	542,460	270,860	243,700	216,540	189,380	162,220	70
75	2,945,260	2,650,660	2,356,060	2,061,460	1,766,860	1,472,260	1,177,660	883,060	588,460	293,860	264,400	234,940	205,480	176,020	75
80	3,175,260	2,857,660	2,540,060	2,222,460	1,904,860	1,587,260	1,269,660	952,060	634,460	316,860	285,100	253,340	221,580	189,820	80
85	3,405,260	3,064,660	2,724,060	2,383,460	2,042,860	1,702,260	1,361,660	1,021,060	680,460	339,860	305,800	271,740	237,680	203,620	85
90	3,635,260	3,271,660	2,908,060	2,544,460	2,180,860	1,817,260	1,453,660	1,090,060	726,460	362,860	326,500	290,140	253,780	217,420	90
95	3,865,260	3,478,660	3,092,060	2,705,460	2,318,860	1,932,260	1,545,660	1,159,060	772,460	385,860	347,200	308,540	269,880	231,220	95
100	4,095,260	3,685,660	3,276,060	2,866,460	2,456,860	2,047,260	1,637,660	1,228,060	818,460	408,860	367,900	326,940	285,980	245,020	100

Per cent of income	Capital Invested 500,000	400,000	300,000	200,000	100,000	90,000	80,000	70,000	60,000	50,000	40,000	30,000	20,000	15,000	10,000	Per cent of Income
10	6,060	4,700	3,340	1,980	800	700	600	500	400	300	200	100	....	....	....	10
15	13,060	10,300	7,540	4,780	2,020	1,744	1,468	1,192	916	640	400	250	100	25	....	15
20	20,060	15,900	11,740	7,580	3,420	3,004	2,588	2,172	1,756	1,340	924	508	200	100	....	20
25	31,560	25,100	18,640	12,180	5,720	5,074	4,428	3,782	3,136	2,490	1,844	1,198	444	175	50	25
30	43,060	34,300	25,540	16,780	8,020	7,144	6,268	5,320	4,300	3,460	2,620	1,780	904	358	100	30
35	54,560	43,500	32,440	21,380	10,320	9,214	8,108	6,930	5,320	4,160	3,180	2,200	1,220	703	150	35
40	66,060	52,700	39,340	25,980	12,620	11,284	9,948	8,540	6,700	4,860	3,740	2,620	1,500	940	272	40
45	77,560	61,900	46,240	30,580	14,920	13,354	11,788	10,150	8,080	6,010	4,300	3,040	1,780	1,150	502	45
50	89,060	71,100	53,140	35,180	17,220	15,424	13,628	11,760	9,460	7,160	4,860	3,460	2,060	1,360	660	50
55	100,560	80,300	60,040	39,780	19,520	17,494	15,468	13,370	10,840	8,310	5,780	3,880	2,340	1,570	800	55
60	112,060	89,500	66,940	44,380	21,830	19,564	17,308	14,980	12,220	9,460	6,700	4,300	2,620	1,780	940	60
65	123,560	98,700	73,840	48,980	24,120	21,634	19,148	16,590	13,600	10,610	7,620	4,720	2,900	1,999	1,080	65
70	135,060	107,900	80,740	53,580	26,420	23,704	20,988	18,200	14,980	11,760	8,540	5,320	3,180	2,200	1,220	70
75	146,560	117,100	87,640	58,180	28,720	25,774	22,828	19,810	16,360	12,910	9,460	6,010	3,460	2,410	1,360	75
80	158,060	126,300	94,540	62,780	31,020	27,884	24,668	21,420	17,740	14,060	10,380	6,700	3,740	2,620	1,500	80
85	169,560	135,500	101,440	67,380	33,320	29,914	26,508	23,030	19,120	15,210	11,300	7,390	4,020	2,830	1,640	85
90	181,060	144,700	108,340	71,980	35,620	31,984	28,348	24,640	20,500	16,360	12,220	8,080	4,300	3,040	1,780	90
95	192,560	153,900	115,240	76,580	37,920	34,054	30,188	26,250	21,880	17,510	13,140	8,770	4,580	3,250	1,920	95
100	204,060	163,100	122,140	81,180	40,220	36,124	32,028	27,860	23,260	18,660	14,060	9,460	4,860	3,460	2,060	100

Find the percentage that income is of the Invested Capital. Opposite this percentage in the table under the amount of Invested Capital the proper tax is shown. If there is any interest on United States obligations deduct 10 per cent of the interest from tax shown by table. Example: If Invested Capital is $300,000 and income $150,000 find tax on 50 per cent line under $300,000 heading, i. e., $53,140.

has announced that tentative income and profits tax returns of corporations will be accepted the same as last year on payment of one-half of the estimated tax, in which case extension will be granted automatically until May 15.

Of outstanding interest in the financial world last week was the pronounced recovery of the European exchanges, lead by sterling which advanced to $3.70 a gain of 50 cents over the low point of $3.19 touched Feb. 4. The basis for the advance was to be found in reports that British gold is to be imported into this country and that action is being taken abroad to retire the Anglo-French bond issue outstanding in the United States and maturing next fall. With India eliminated as a bidder for South African gold, it is understood that American bankers are arranging to buy this metal, for which an open market is now permitted by the British government.

Expectations that the adverse trade balance against Europe would be repaired by gold imports are absurd, however, in view of the fact that $1,000,000,000 every three months would be required for this purpose, while but $250,000,000 is the maximum mentioned as available from the Transvaal this year. The most substantial cause for optimism is found in the fact that the Anglo-French bonds are to be retired promptly, the bulk of the issue already having been purchased by the governments. Speculative activity took the exchanges to a point which perhaps will not be maintained just as it forced them down one month ago below a justifiable level.

Great Increase Shown in British Foreign Trade

The board of trade returns for January show substantial increases in Great Britain's foreign trade. The total value of the month's imports was £183,498,388, which is £48,951,952, or 36.38 per cent more than the total for the same period last year. Exports of British produce for the month totaled £105,879,909, an increase of £58,536,728, or 123.64. Exports of foreign and colonial merchandise for January were returned at £25,464,477, an increase of £20,904,358.

The quantity of iron and steel and manufactures thereof exported in January was 257,158 tons, compared with 169,285 tons in January, 1919, while the value was £8,181,080, against £3,917,721. The quantity of coal exported last month was 3,358,572 tons, against 2,249,573 tons in January, 1919, and the value was £11,542,137, against £4,072,892. Some of the more important iron and steel exports were as follows:

	January, 1919 Tons	January, 1920 Tons
Pig iron	34,953	51,356
Iron, wrought bars, angles, etc.	3,153	4,279
Galvanized sheets	2,195	35,162
Wire (iron or steel)	634	4,720
	£	£
Black sheets	401,847	321,761
Black plates	1,099	155,057
Hoops and strips	84,350	161,572
Cast iron	48,009	108,735
Steel bars, etc.	491,246	661,559
Manufactures of iron and steel	218,562	532,934
Tinned plates and sheets	677,739	1,269,036
Copper	37,304	631,317
Lead	48,356	102,990
Tin	254,385	396,500
Zinc	19,415	68,869

Steel Foundries' Earnings Greatly Increased

Acquisition of the Griffin Wheel Co., and the resulting extension of operating activities proved a profitable undertaking for the American Steel Foundries the company's annual report shows. Net earnings in 1919 were $6,107,824 as compared with $4,442,237 in the preceding year. The company's tax reserve was increased from $1,357,200 in 1918 to $1,627,089 in the year just closed. The consolidated balance sheet of the company reveals a strong financial position, current assets being $21,720,496 against current liabilities of $4,125,080, leaving net working capital of $17,595,416. Inventories were $7,151,180 against $6,379,046 in the previous year. The comparative income account follows:

	1919	1918
*Net earnings	$6,107,824	$4,442,237
Depreciation, etc.	333,296	426,411
Operating profit	5,774,528	4,015,825
Miscellaneous income	340,478	173,598
Total profit	6,115,007	4,189,424
Interest	277,283	136,496
Balance	5,837,723	4,052,927
Federal tax reserved	1,627,089	1,357,200
Net profits	4,210,633	2,695,727

*Including earnings of Griffin Wheel Co. for six months.

Discussing the future, President R. P. Lamont said that if the company's prospects were to be judged by the known necessities of the roads "we should have a good year, but everything depends upon what is done in Washington. Any considerable amount of railroad business added to the present volume of general business will still further add to the scarcity of labor, increase our costs and make operating conditions generally just that much more difficult," he said. "The effect of these unfavorable operating conditions may be reflected in the earnings, but your plants and organizations are in position to handle their share of whatever business offers and we are hopeful of a good year."

President Lamont points out that while the business of the Griffin Wheel Co., which produces cast iron car wheels, comes largely from the railroads, it is not dependent upon new construction. Practically no new cars were ordered during the year, yet earnings from replacement business were considerable. As a further expansion the report states that the company has incorporated the American Autoparts Co., at Detroit, to make automobile springs, the capital stock of which is practically all owned by the American Steel Foundries. The plant is under way and should begin operations about the middle of the year.

A meeting of the stockholders of the company will be held March 18 to pass on the proposal to increase the common stock from 515,520 shares of $33.33 each to 750,000 shares. The purpose of the issue is to provide a means to distribute some of the surplus accumulated in the form of extensions and additions, etc. The stock may also be used to acquire new facilities.

Superior Does Well

The earning showing of the Superior Steel Corp. in 1919 supplies further evidence that the Pittsburgh district was less seriously affected by the steel strike last fall than the Youngstown, Buffalo and other iron and steel centers. The company reports for the year gross sales of $7,661,277 against $8,961,862 in the preceding year. After taxes and other expenses surplus was $816,726 compared with $831,504 in 1918. The comparative income account follows:

	1919	1918
Gross sales	$7,661,277	$8,961,862
Manufacturing profit	1,714,344	2,372,431
Miscellaneous income	124,233	178,912
Gross income	$1,838,577	$2,551,343
Expenses, taxes, etc.	263,944	211,977
Plant depreciation	218,224	300,000
Net income	$1,356,409	$1,939,366
1st pfd. sinking fund	105,000	105,000
2nd pfd. sinking fund	60,000	60,000
Federal taxes	374,683	942,862
Balance	$816,726	$831,504
Dividends	588,404	800,475
Surplus	$228,322	$31,029
Previous surplus	501,034	466,926
Discount on pfd. stk. pur.	1,896	3,079
Total surplus	$731,252	$501,031

In his statement to stockholders, President E. W. Harrison said:

The demand for our product is greater than we ever experienced, and the future indicates that very good results will be obtained during the coming year.

General Aluminum & Brass Mfg. Co., of Detroit, has received approval of the Michigan securities commission for the sale of $1,200,000 of new preferred stock, which also validates the entire issue of common and preferred stock of the company to the amount of $4,500,000.

Railroads Inquiring for Tools

Several Sizable Lists Out—Others About to Appear—Inquiries of Size Are Scarce — Buying Is Spasmodic—Some Projects Abandoned—Inquiries Are Withdrawn — Crane Demand Falling Off

DEPRIVED of machinery for several years, the railroads have become active immediately on their return to private management. The past week has seen the issuance of a few more inquiries, including those from the New York Central and the New York, New Haven & Hartford roads in the east, calling for $100,000 worth each. The Great Northern railroad asks for 14 tools and a crane in Chicago. The Hocking Valley and the New York Central for lines west have prepared lists in Cleveland and these soon will be issued as will inquiries by the Delaware & Lackawanna, the Lehigh Valley, the Pennsylvania and other roads, which are known to be busy at work on their requirements.

Other sizable lists which enter an otherwise dull market come from the Lord Construction Co., New York, 25 tools; Honolulu Iron Works, New York, $60,000 worth of equipment; Holt Mfg. Co., Peoria, Ill., a number of machines; the Watters Corp., St. Louis, care of D. A. Pittaway, Cleveland, $100,000 worth; Wellman-Seaver-Morgan Co., Cleveland, several new and used tools for Akron, O., while the Star Specialty Co., Toronto, Ont., has issued a list in Canada of 23 items including 14 presses, etc.

Spasmodic buying continues, most of which is for absolute needs, since poor deliveries and high prices are discouraging some prospective buyers. The General Electric Co. took $60,000 worth for Schenectady, N. Y. It will build a large plant in Philadelphia. The Perth Amboy Drydock Co., Perth Amboy, N. J., closed on $80,000 and the American La France Fire Engine Co., Elmira, N. Y., bought 10 machines for Bloomfield, N. J. The Crowninshield Shipbuilding Co., South Somerset, Mass., bought fabricating equipment and the Carnegie Steel Co., took blacksmith shop machinery for Baltimore. The Winton Motor Car Co., and the White Motor Co., Cleveland, both bought some equipment in Cleveland.

The decline in new inquiry for cranes is becoming more pronounced. Several inquiries have been withdrawn, particularly in the east and a number of projects have been abandoned which seemed to promise large equipment needs. The Solvay Process Co., Syracuse, N. Y., bought five cranes, as did J. R. Hogan Co., Philadelphia. The American Steel & Wire Co., Cleveland, bought 20 hoists. For the most part, however, crane orders and inquiries call for one each. Exceptions are the Perth Amboy Drydock Co., the Braddock Steel Foundry Co., Braddock, Pa., and the Foundation Co., each of which took two cranes. The abandoned projects include the motor truck plant of the Bethlehem Motor Truck Co., Allentown, Pa., and the $1,000,000 steel plant at Long Island City of Eggleston Bros. & Co., New York City. Inquiries are being withdrawn because of the tight money markets and high prices of building materials and labor.

New business is moderate likewise in Pittsburgh and makers who supply that market welcome the lull as a breathing spell. It is claimed that the Pittsburgh Plate Glass Co. will need nine more cranes for Ford City, Pa., and Kokomo, Ind. The Westinghouse Electric & Mfg. Co., East Pittsburgh, wants four and Sotter Bros. Inc., Pottstown, Pa., has inquired for three in addition to some metal-working equipment.

Few Fair-sized Lists Interrupt Dull Tool Trading

OF SPECIAL interest to the eastern machine tool trade at this time is the appearance of two substantial lists from the railroads. One is from the New York Central railroad, involving more than $100,000 worth of miscellaneous machine tools, and the other is from the New York, New Haven & Hartford railroad, for a similar amount. These inquiries, in addition to the list recently mentioned as issued by the Baltimore & Ohio, are the largest now current, although the Delaware & Lackawanna and Lehigh Valley railroads are expected to bring out good sized lists in the very near future, and the Pennsylvania lines east are being watched closely.

The eastern machine tool market as a whole, however, remains fairly dull. One inquiry which is somewhat outstanding is that of the Lord Construction Co., 104 West Fortieth street, New York, involving approximately 25 miscellaneous machines for the drydock project at Weehawken, N. J. The Honolulu Iron Works, 233 Broadway, New York City, is inquiring for about $60,000 worth of machine shop equipment, including a number of small lathes and punch presses. Due to labor trouble, the Baltimore Dry Dock & Ship Building Co., Baltimore, has temporarily withdrawn its inquiry for six fabricating machines.

One of the larger recent buyers is the General Electric Co., which closed within the past few days on $60,000 worth of equipment, including milling machines, lathes,

Making Ludlum Tool Steel

Prompt shipments from our warehouse stock at Watervliet, N. Y.; Detroit, Mich.; Chicago, Ill.; or Cambridge, Mass., handled thru our Branch Offices.

LUDLUM
CONSISTENTLY UNIFORM BRANDS

Mohawk Extra
High Speed Steel
Albany
Alloy Tool Steel
Huron
Alloy Die Steel
Seminole
"Foolproof" Chisel Steel
Pompton
Carbon Tool Steel
Oneida
Oil Hardening Tool Steel
Teton
Ball Bearing Steel
Yuma
Chrome Magnet Steel

Heating *Ludlum High Speed Steel Ingots* for rolling means something more than simply getting them hot. It means that the temperature must be brought up gradually to the desired point. If it is brought up too quickly, certain stresses and strains occur which cause fractures.

One reason why Ludlum Steels are consistently uniform is because of the care taken by our ingot heating teams.

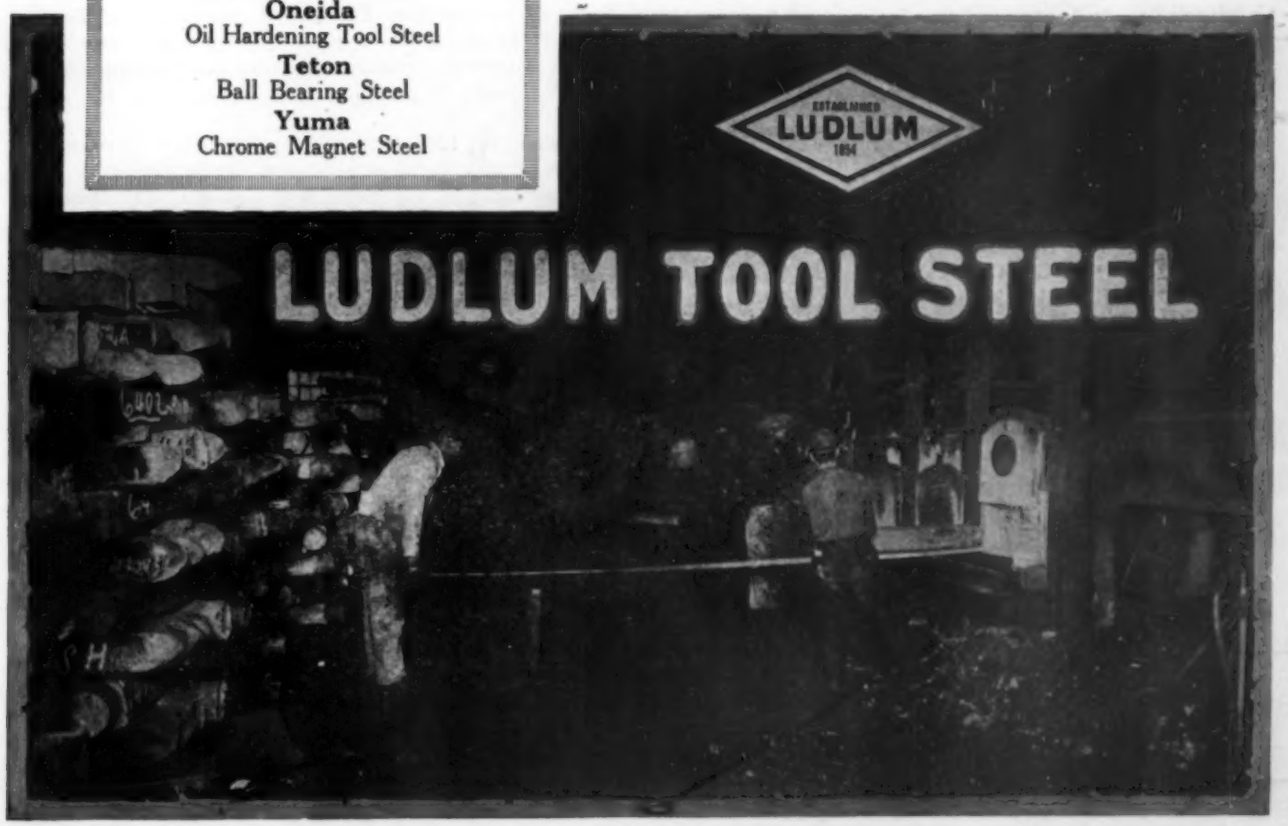
Ludlum Steels have been selected by the majority of large users and twist drill and milling cutter manufacturers, as the steels best suited for their purposes.

Ludlum Steel Company

General Office and Works
WATERVLIET, N. Y.

Branch Offices:

Chicago, Cambridge, Mass., Detroit, Buffalo, New York City Cincinnati, Cleveland, Philadelphia, Pittsburgh



planers and grinders, for installation principally at Schenectady, N. Y. This company, it has just been divulged, is to build a $10,000,000 plant in Philadelphia, fronting along Elmwood avenue between Sixty-eighth and Seventieth streets. According to G. P. Baldwin, district manager, the plant will employ about 6000 persons. Another substantial buyer has been the Perth Amboy Drydock Co., Perth Amboy, N. J., which closed on $80,000 worth of machinery with one New York seller. Still another has been the American La France Fire Engine Co., Elmira, N. Y., which bought 10 machine tools for its proposed plant at Bloomfield, N. J.

It is reported that the Bethlehem Motor Truck Co., Allentown, Pa., has at least temporarily abandoned its plant project for which it inquired for 15 machine tools. It is also reported that the Nathan Mfg. Co. has sold its plant at Flushing, L. I., and is planning to re-establish its works in New York City. The company is offering a sizable lot of used machines for sale. The Worthington Pump & Machinery Corp., 115 Broadway, New York City, has also placed upon the market a list of about 30 used machines at its plant in Harrison, N. J. The purchasing department of the American Locomotive Co., 30 Church street, New York City, has been reorganized with L. S. Carroll, formerly purchasing agent of the Chicago, Northwestern railroad, in charge.

Further buying includes a list of blacksmith shop equipment for the Baltimore plant of the Carnegie Steel Co., and a list of about five fabricating machines for the Crowinshield Shipbuilding Co., South Somerset, Mass. Some flue shop equipment has also been purchased by the Baldwin Locomotive Co. for its plant at Eddystone, Pa. The Dunlop-America Co., Ltd., has established a purchasing department in Buffalo, in charge of John Whalen. It will purchase all machine tool equipment for the company's plant to be erected in that city. The crane requirements, however, will be handled through the Foundation Co., 233 Broadway, New York City.

Export buying of the past week has included a list of radial drills, drill presses, cap lathes and planers for Japan. Cuba and Spain also have been good buyers. A heavy list for an industrial concern in Brazil will likely be closed very shortly. The foreign market, all in all, however, is quiet.

Among the recent crane inquiries is a 20-ton electric overhead unit for the John Swenson Granite Co., Concord, N. H. The Foundation Co., 233 Broadway, New York City, is inquiring for a 10-ton electric crane, with 60-foot span, for the Dunlop-America Co., Ltd., now erecting a plant at Buffalo. The Spicer Mfg. Co., South Plainfield, N. J., is in the market for a 7½-ton electric crane. The Gaint Engineering & Commerce Corp., Singer building, New York City, is inquiring for a 5-ton overhead crane for shipment to France. The United Phosphate & Chemical Co., Richmond, Va., is in the market for an 8-ton used locomotive crane, with a lifting capacity of 4 long tons. The Chambersburg Engineering Co., Chambersburg, Pa., is expected in the market shortly for a crane for foundry service.

While orders for cranes continue to be placed in fairly good volume the decline in new inquiry is becoming pronounced. A number of inquiries are current, apparently for estimating purposes, but few of these are regarded as being alive. One large crane builder asserted that reports just at hand show that in February more projects were abandoned in this territory than in any other month in possibly several years. Approximately 80 projects were abandoned due, he believes, to the high prices of building materials and uncertainties as to deliveries. One instance in point is that of Eggleston Bros. & Co., New York City, which was to erect a $1,000,000 steel plant in Long Island City. Because estimates exceeded by 200 per cent the original figures, the project regarded as exceedingly active early in February has been abandoned.

The Solvay Process Co., Syracuse, N. Y., awarded one 35 and four 25-ton electric overhead cranes to the Bedford Foundry & Machine Co., Bedford, Ind. The J. R. Hogan Co., Philadelphia, bought five 2-ton overhead cranes of the transfer type from the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., which also received orders for 20 2½-ton hoists from the American Steel & Wire Co., Cleveland, two 3-ton hoists from the American Locomotive Works for Chester, Pa., and a 7½-ton hoist for India and one 2-ton for Japan.

The Andersen-Meyer Co. of China, Ltd., 80 Wall street, New York City, placed two 20-ton, 3-motor cranes, with 48-foot span, with the Milwaukee Electric Crane & Mfg. Co., Milwaukee. The cranes are for export. The National Enameling & Stamping Co., Granite City, Ill., purchased a 40-ton electric crane, with 44-foot span and 15-ton auxiliary from the Champion Engineering Co., Kenton, O. The Federal Ship Building Co., Kearney, N. J., bought a 5-ton overhead crane from the Pawling & Harnischfeger Co., Milwaukee. The Schmidt & Ault Paper Co., York, Pa., has purchased a 20-ton locomotive crane, with 50-foot boom, from the Ohio Locomotive Crane Co., Bucyrus, O., and the Public Service Electric Co., Newark, N. J., a 25-ton locomotive crane, with 50-foot boom, from the McMyler-Interstate Co., Bedford, O. Other orders include a 5-ton electric crane, with 37-foot span, for the Todd Shipyards, Inc., New York City. The contract went to the Niles-Bement-Pond Co., New York City. The Perth Amboy Drydock Co., Perth Amboy, N. J., also awarded two 10-ton electric cranes to the Niles company. The Midvale Steel & Ordnance Co., Philadelphia, bought a 2-ton handpower crane from the Euclid Crane & Hoist Co., Euclid, O. The American La France Fire Engine Co., Elmira, N. Y., awarded a 10-ton electric crane for its proposed plant at Bloomfield, N. J., to the Bedford Foundry & Machine Co., Bedford, Ind. A 10-ton crane with a 37-foot span, was placed by the American Rolling Mills Co., Middletown, O., with the Champion Engineering Co., Kenton, O., for Zanesville, O.

Activity in locomotive cranes included the purchase of two 10-ton locomotive cranes from Orten & Steinbrenner, Chicago, by the Foundation Co., 233 Broadway, New York City, the equipment being for installation at the Dunlop-America company's proposed plant at Buffalo. The Bethlehem Steel Co. purchased two used Browning locomotive cranes. The Crane Co., Bridgeport, Conn., has withdrawn its inquiry for a 20-ton locomotive crane.

Some Hesitation Noted By Cleveland Sellers

SOME hesitation on the part of machinery buyers in the Cleveland district is noted by sellers. A tendency exists to hold off on expansion plans due to the tightening of the money markets and many building programs have been called off due to the high costs of labor and building material. Deliveries continue to be the prime factors in deals that are closed for equipment since only purchases of absolute requirements are being made and these go to the sellers who can offer the best delivery dates.

Immediately after the railroads returned to private ownership their operators who have been starved for equipment for several years, commenced to stir themselves. The inquiry of the Nickel Plate for 28 machines still is before some dealers. The Hocking Valley railroad has prepared a list of about 40 machines and this is due to be issued by the purchasing department any day. The New York Central,

Who Are the Candidates?

Say, Fellas:

Pickin' our next President is a good bit harder than pickin' good rolls, for that's easy.

Get Hubbard Rolls, and you're sure you've got good ones.

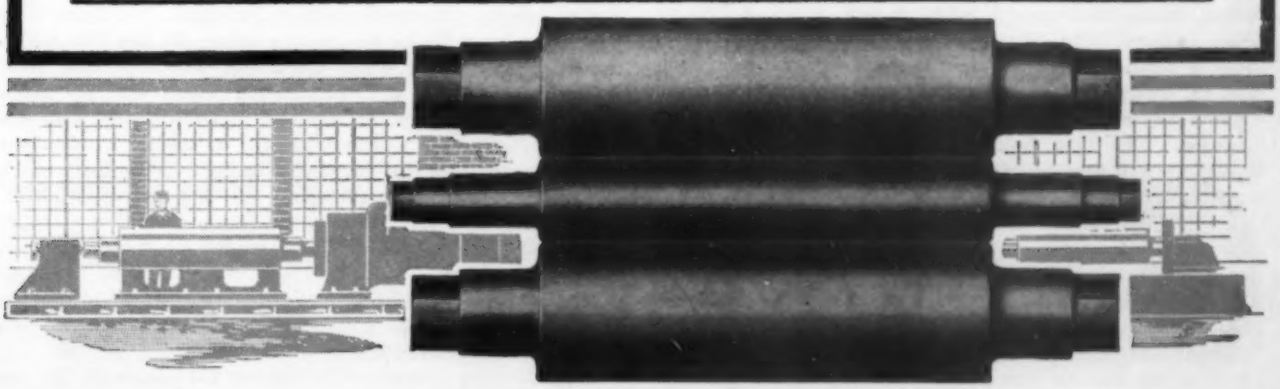
So Long,

Rolling Mill Jim.—

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings.



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which has issued a large list for lines east of Buffalo, also has a large list prepared for early issuance from Cleveland for lines west of Buffalo. Other business of this character is looked for in large volume during the next few weeks.

Among the larger lists before Cleveland dealers is the one issued by the Wellman, Seaver, Morgan Co., Cleveland, for its Akron, O., tractor plant. This calls for several new and used machines. Another tractor company to issue an inquiry calling for quite a number of machine tools is the Holt Mfg. Co., Peoria, Ill. The Watters Corp., St. Louis, Mo., has a representative in Cleveland, D. A. Pittaway, 901 East 141st street, endeavoring to purchase about $100,000 worth of machinery. Included in the list is three No. 2 Brown & Sharpe automatic screw machines, three No. 5 Niagara or Bliss presses of equal size, two No. 5 Niagara presses or Bliss of equal size, two No. 20 Bliss presses, two No. 0 Brown & Sharpe automatic screw machines, two No. 2 Brown & Sharpe automatic turret forming machines, two No. 4 Niagara or Bliss presses of equal size, two No. 20 or 20½ Bliss presses, one No. 7 A Bliss double crank press, one No. 25 double crank press, one No. P 4 Feracute press or Bliss of equal size, one No. 00 Brown & Sharpe automatic screw machine, one No. 0 Brown & Sharpe automatic cut-off machine and one No. P 4 Feracute press. This corporation also wants cold rolled flat stock in the following sizes: 40-1000, 50-1000, 65-1000, 95-1000 and 32-1000 thick up to 2000 pounds each. It will consider purchasing a plant outright. The Efficiency Electric Co., Park avenue, East Palestine, O., is in the market for punch presses, drill presses, engine lathes, riveting machine, shapers, power shears and electric welders. The Manistee Steel Products Co., Manistee, Mich., probably will be in the market soon for presses, hammers, etc. The National Acme Mfg. Co., Cleveland, announces it will build a large addition covering two acres to its plant at East 131st street and Coit road and while a formal list has not as yet been issued, machinery dealers representatives made calls the early part of this week, since the company's plans are to start actual construction in about a month.

Most of the inquiries reaching Cleveland sellers, however, are for one or two tools. The Arthur B. Shepard Co., Cleveland, is looking for one alligator type shear for cutting ¼-inch plate. The Hoffman Heater Co., Lorain, O., is in the market for a milling machine, one 24-inch engine lathe and a 30 or 40-inch Niagara shears. The Champion Machine & Forge Co., Cleveland, entered the market recently for six power hammers. W. D. Hart, 205 Parkman street, Warren, O., has not closed as yet on lathes, shaper, miller, grinder and hand tools for which he recently asked. The Erie Stove & Mfg. Co., Erie, Pa., wants a used No. 3 Crescent universal saw table. The Saxer Machinery Co., that city is in the market for 3/8 to ½-inch model B Cleveland automatics. A. G. Schoonmaker & Sons, 25 Church street, New York, are inquiring in Cleveland for 18-inch gear cutters. The Koppel Industrial Car & Equipment Co., Koppel, Pa., wants a screw cutting double back geared lathe, 28-inch swing, 8 feet between centers. The Monroe Sheet Metal Works, Detroit, needs a bending brake. The Foos Gas Engine Co., Springfield, O., wants a Gould & Eberhart or Brown & Sharpe gear cutter heavy enough to cut 2½-pitch steel gears 42 inches in diameter. The Otis Steel Co., Cleveland, still is in the market for roll turning lathes. B. P. Holland, Mehering, Va., wants a woodworking lathe. The Pennsylvania Equipment Co., 1420 Chestnut street, Philadelphia, is in the market for a used machine lathe to turn 35-inch locomotive tires to be used for general turning and thread cutting. The Royal Metalware Mfg. Co., Denton, N. C., desires a metal spinning lathe with 15-inch swing. The New Orleans Motor Truck Co., 5300 Tchoupitoulas street, New Orleans, wants machine tools, turret lathes, etc., to manufacture motor trucks.

Inquiries for heavy equipment are fairly numerous. One interesting inquiry before the trade comes from Sotter Bros. Inc., Pottstown, Pa., manufacturer of steam boilers. It wants a 25-ton crane with 55-foot span and two 10-ton cranes with 35-foot spans; one set of bending rolls for 12-inch pipe with 10 feet between housings; one bevel shears; one horizonal punch, one angle bending machine; one riveter with 6 or 7-foot reach; one air compressor, 500 to 800 cubic feet capacity; small tools such as reamers, drills, both wall and radial; oil furnaces for rivet heating and tool hardening, etc. The Harvey Co., 113 South street, Baltimore wants two locomotive cranes, one each 10 and 15-ton with 40 and 50 foot boom respectively, while the Osceola Cypress Co., Bridgent, Fla., wants a 15 to 20-ton crane of the same type. An electric traveling crane of 5 to 10-ton capacity is wanted by the Lehigh Structural Steel Co., Allentown, Pa., distance from center to center of crane rails to be 57½ feet; height from floor to top of rail, 20 feet, alternating current, 220-volt, 3-phase, 60-cycle.

Recent purchasers in Cleveland, include the Winton Motor Car Co., taking among other equipment some milling machines; the White Motor Co., drills; the General Electric Co., Erie, Pa., miscellaneous equipment; Industrial Foundry Co., St. Johns, Mich., foundry equipment to triple capacity.

Prospective purchasers of machine tools in the Cleveland district include the Dimler-Himes Co., Dayton, O., which recently increased its capital from $20,000 to $150,000 to finance a building for which equipment will be required; Eclipse Auto Body Mfg. Co., Hammond, Ind., which is having plans prepared for a 42 x 72-foot machine shop; the Leonard Tractor Co., Gary, Ind., which is to start work on a $2,000,000 plant soon; the American Electric Heater Co., Detroit, to build a 2-story plant, 30 x 130 feet; the Wheeling Machine Products Co., Pleasanton, W. Va., machine shop, 40 x 80 feet; the Victory Tool Co., Waynesboro, Pa., machine shop addition to cost $12,000; the Auer Register Co., Cleveland, 2-story plant, 75 x 100 feet to cost about $100,000; the Reynolds Machine Co., Massillon, O., which recently increased its capital from $200,000 to $500,000; the American Mfg. Co., Dayton, O., newly chartered at $100,000 to manufacture washing machines; the Clark Engine & Boiler Co., Kalamazoo, Mich., which increased its capital from $200,000 to $350,000, and Ireland & Matthews Mfg. Co., Detroit, which increased its capital from $800,000 to $1,500,000.

Lull is Welcome to Manufacturers

NEW business in the Pittsburgh equipment market remains of rather moderate proportions. With makers both of heavy machinery and machine tools booked ahead for several months as a result of the liberal orders of the past few months, however, the present lull is welcomed as a breathing spell. Few of the builders of cranes can now guarantee deliveries in less than 90 days.

Considerable business still is in sight. At least nine cranes still are to be let for the plants of the Pittsburgh Plate Glass Co. at Ford City, Pa., and Kokomo, Ind., while the Koppers Co., Pittsburgh, which will put up a new by-product plant at Chicago in conjunction with the Peoples Gas Co., Chicago, wants a 10-ton hand-power crane in addition to the 5-ton electric crane for which the inquiry recently went out. The Westinghouse Electric & Mfg. Co., East Pittsburgh, wants three 5-ton cranes of 58½-foot span and one 5-ton crane of 47½-foot span. The Weirton Steel Co., Weirton, W. Va., is in the market for a 3-ton, 41½-foot span, pickling crane, while the McKeefrey Iron Co., Pittsburgh, wants a 15-ton, 45-foot span crane for its plant at Leetonia, O.

The Whiting Foundry Equipment Co., Harvey, Ill., re-

BERWICK
ELECTRIC RIVET HEATER

Gives a hot rivet in 30 seconds.
Heats 100 pounds of any size rivet in 20 kilowatt hours.
Reduces rivet loss to less than ½ of 1%.
Eliminates smoke, gas, dirt and intense heat.
Provides uniformity of heat, radiating from the center outward.
There is a heater built to meet your conditions—10 Types.

No. 3 five-electrode, also built with one or three electrodes, heating ⅝," ¾," ⅞" and 1" diameter rivets, up to 4½" long, or longer. Capacity over 450 per hour if required.

The **Berwick Electric Rivet Heater** was first built to improve our own shop conditions six years ago.

Over 50 in daily use for several years.
All experimental features have been worked out.
Simple to operate, portable, absolutely safe and nearly fool-proof.
Maintenance cost practically nil.
Write and give alternate current conditions and give requirements.

AMERICAN CAR AND FOUNDRY COMPANY
EXECUTIVE OFFICES 165 BROADWAY
NEW YORK, N. Y.

cently took two cranes for the Braddock Steel Foundry Co., Braddock, Pa. In addition to a new blast furnace for the Donora, Pa., works of the American Steel & Wire Co., complete plans for which call for ore bridges, conveyors, etc., the United States Steel Corp. is expected to come out with plans for extensive improvements at plants of the other subsidiary companies, before the year is much further advanced, notably at the Ohio works of the Carnegie Steel Co., at Youngstown, O. The Union Electric Steel Co., Pittsburgh, with works at Carnegie, Pa., will add to its capacity by the installation of another electric furnace. The Union Tool Co., Los Angeles, has taken over the plant of the Alloy Steel Forging Co., at Carnegie, Pa., which it will operate. Part of the equipment for this plant, however, will come from the plant of the company at Chicago.

Lull Experienced in Chicago Trading

BUYING of machine tool equipment in the Chicago district appears to be quiet generally and practically no large inquiries are being considered. This condition has existed to some extent for about a fortnight, but is not thought to be indicative of a slump in business, being rather a lull due to legitimate causes. Much shopping is being done by users desirous of obtaining immediate delivery, and dealers here are busy showing such machinery as they have on floors with consequent sales which represent a fairly large aggregate.

Deliveries are rather mixed, in some cases several months being the best that can be done by builders, while in other cases immediate delivery can be made. In a few instances recently machine tool manufacturers have notified dealers that they can give prompt shipment on various lines and in some cases contract deliveries have been anticipated. This result is brought about by considerable equipment sold for export being cancelled and thus made available to apply on domestic buying. Its effect probably is temporary, as the quantity of export machinery is not large.

Expected inquiry by railroads for machine shop equipment has not yet appeared and purchasing agents are quiet about their intentions. The Great Northern railroad has issued a list, reproduced on page 810, this issue, inquiring for 15 tools, but this is the only one current in this market.

The Ursus Mfg. Co., Chicago, is starting construction of a plant to consist of four units which will require about a year to complete. The Fruin Drop Forge Works, Chicago, will add to its forge shop. The Acme Aluminum & Brass Works, Indianapolis, has started work on a plant containing 30,000 square feet of floor space. The Auto Chain Pull Co., Oklahoma City, a newly chartered concern, will build a plant at once. The Superior Steel Castings Co., Benton Harbor, Mich., will build a gray iron and malleable foundry and a forge shop.

Higher Prices Do Not Affect Demand

NOTWITHSTANDING the higher prices which are now prevailing for machinery and tools in the Canadian market there is apparently no let up in the demand. The dealer who is in a position to give anything like prompt delivery, however, is getting all the business he can handle. Carbon drills have advanced $16.20 on a $100 purchase. Canadian high-speed cutters also have been changed for the large buyer from 10 off the list to net list; the small buyer will pay list plus 10 instead of net list as in the past. Considerable business is moving in the small tool field, and there are no prospects of any let-up in the demand for machinery and equipment in this market.

The Star Specialty Co., 661 Queen street east, Toronto, Ont., is in the market for the following equipment for immediate delivery: Four No. 20 Bliss presses; eight small power presses; one 80-inch gang press; one 50-inch gang press; one double end shears; one light bulldozer; two angle bending tables; three gas furnaces; one 6 x 6-inch air compressor and tank; one blower and tank; enameling equipment complete and tool room equipment. William Ward, Lucan, Ont., is asking for a 15-horsepower, 3-phase, 25-cycle, 220-volt motor complete with starter. The Canada Foundries & Forgings, Ltd., Welland, Ont., is in the market for an upsetting machine, 3½ or 4 inches, for immediate delivery. Extensive improvements will be made to the plant of the Consolidated Mining & Smelting Co., Trail, B. C., including extensions and installation of new equipment in copper refinery to cost $250,000; the erection of a rod mill which will cost, including equipment, $200,000, as well as the erection of an addition to the machine shop and the installation of machinery. The Grand Trunk Pacific railway will make improvements to its dock at Prince Rupert, B. C. The dock will be 173 x 860 feet wide and will be equipped with tracks, traveling cranes, two elevators and all modern equipment.

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

AUGUSTA, ME.—The Marine Products Co. has been incorporated with $250,000 capital, by George H. Rausch, Alfred W. Jansen and Ernest L. McLean.

ELLSWORTH, ME.—H. F. Westcott Hardware Co. has been incorporated for $50,000. Horace F. Westcott is president and treasurer.

KITTERY, ME.—The H. & E. Co. has been incorporated to build machinery with $85,000 capital, by George E. Burnham, M. E. Anderson and Elmer J. Burnham.

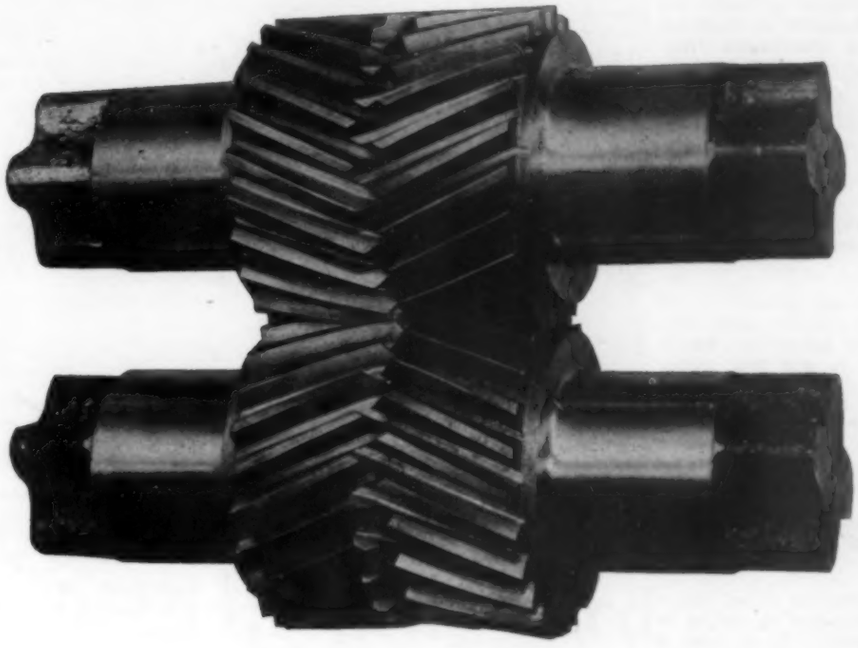
PORTLAND, ME.—The Crane Co., Chicago, has purchased land here on which it plans to erect a branch manufacturing plant.

PORTLAND, ME.—The J. B. Crandon Co. has been incorporated to make sulphur detectors with $20,000 capital, by Arthur H. Scott and Solomon W. Bates.

BOSTON.—The Edison Electric Illuminating Co. of Boston has acquired a tract of land at Weymouth, Mass., and is preparing plans for a power plant.

BOSTON.—The Universal Shock Absorber & Auto Sales Co. has been incorporated for $250,000 to manufacture automobile parts and promote inventions.

BOSTON.—The Hopkins Mfg. Co. has been incorporated for $30,000 to manufacture tools and motor



MILL PINIONS

MADE FROM

Open Hearth Steel Castings

We own and operate one of the largest steel foundries in the West, making castings from 1 to 100,000 pounds.

THE FALK COMPANY

MILWAUKEE, WIS.

AGENTS: Pittsburgh—W. O. Beyer, 1007 Park Bldg. New York—M. P. Fillingham, 50 Church St. Wilkes-Barre—Vulcan Iron Works. Denver—Denver Engineering Works. San Francisco—F. W. Grimwood, Rialto Bldg.

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parts. Alfred Hopkins is president and George W. Robinson is treasurer.

BOSTON.—The Luxus Auto Co. of Boston and Warsaw, Poland, has been incorporated for $1,500,000 to manufacture and deal in motor vehicles. Teofil J. Varbely of Salem, Mass., is one of the incorporators.

EAST SPRINGFIELD, MASS.—Bids have closed for a 1-story plant for the F. F. Storms Drop Forging Co.

HOLYOKE, MASS.—The Burr Appliance Co. has been incorporated with $250,000 to manufacture mechanical and electrical equipment. Charles F. Munder is president.

LYNN, MASS.—Plans are being prepared for a 100 x 200-foot shop, three 50 x 300-foot storage buildings and two open marine railways, 200 feet in length, to cost $150,000, for Britt Bros., builders of motor yachts.

MILFORD, MASS.—H. S. Chadbourne Co. has been incorporated with $20,000 capital to manufacture hardware and tools. F. S. Adams is president and Harry S. Chadbourne is treasurer.

SPRINGFIELD, MASS.—The Moore Drop Forging Co. has let the contract for a 1-story, 55 x 55-foot office building.

SPRINGFIELD, MASS.—The New England Tool & Machine Co. has been incorporated for $25,000 to manufacture tools and machines. Max J. Cohen is one of the directors.

WESTFIELD, MASS.—Bids have closed for a one and 3-story 60 x 100-foot plant for the Westfield Mfg. Co.

WOLLASTON, MASS.—Vedoe Peterson & Co., die makers, have let the contract for a 1-story, 50 x 117-foot machine shop.

WORCESTER, MASS.—The Worcester Grinding Co. has been incorporated for $10,000 by H. W. Northbridge, E. G. Woodward and J. H. Matthews

WORCESTER, MASS.—Plans are being drawn for a 6-story, 75 x 150-foot plant for the Norton Co., to be used by the grinding machine division.

WORCESTER, MASS.—The Worcester Electric Light Co. will increase its capacity by 20,000 horsepower. The new work includes the installation of boilers, a new stack, locomotive crane, additional spur tracks and other improvements.

PROVIDENCE, R. I.—The Narragansett Electric Light Co. will erect a 5-story, 76 x 95-foot brick building addition.

PROVIDENCE, R. I.—The Cathedral Art Metal Co. has been incorporated with $100,000 capital, by William A. Peck, East Providence, R. I., R. L. Papin and Walter A. Briggs, Attleboro, Mass.

PROVIDENCE, R. I.—The General Electric Co. has taken over the plant of the D. & W. Fuse Co. The plant, however, will continue in operation under the same name but the plans of the new owner contemplate extensive additions and alterations.

BRIDGEPORT, CONN.—The Harvey Mfg. Co., Inc., has been organized by M. Trace, W. B. Davies and D. P. Mendelson to manufacture mechanical devices.

BRIDGEPORT, CONN.—The Harvey Mfg. Co. has been incorporated to make mechanical devices with $5000 capital, by Meyer Trace, W. B. Davies, D. P. Mendelson and Gus Mendelson.

HARTFORD, CONN.—The Hartford-Oneida Co. has been incorporated for $50,000 to manufacture and deal in trucks.

HARTFORD, CONN.—The Carling Tool & Machine Co. has been incorporated with $50,000 capital, by Arthur Carling, E. S. Sandberg and Alexander Hokenson.

HARTFORD, CONN.—The L. S. Knoel & Co., Inc., has been organized with $50,000 capital to manufacture and deal in hardware supplies. The incorporators are L. S. Knoel, J. A. Levy and E. Eckstein.

NEW HAVEN, CONN.—O. B. North & Co., Inc., has let the contract for a foundry, 37 x 107 feet.

PLAINVILLE, CONN.—The Hardware City Mfg. Co. of New Britain has taken over the plant of the Elm City Brass & Rivet Co. and will continue the manufacture of the trunk hardware.

SHELTON, CONN.—The Holmes Mfg. Co., manufacturer of air-cooled gasoline motors and tractors, plans a 2-story, 50 x 150-foot plant.

STAMFORD, CONN.—The Carlisle Cord Tire Co. has let a contract for a 1-story, 150 x 250-foot plant, to cost about $100,000.

North Atlantic States

BATAVIA, N. Y.—The Batavia Clamp Co. contemplates a factory building.

BINGHAMPTON, N. Y.—Plans are being prepared for J. Kresner for a machine shop, two stories, 96 x 150 feet.

CLIFTON, S. I. N. Y.—Fraser, Brace & Co., 1428 Broadway, New York, contemplate a ship repair drydock.

Great Northern Road Wants Equipment

AMONG the first lists to be issued by railroads in the Chicago territory, subsequent to their return to private ownership, is the following from the Great Northern railroad. It comprises 14 machines and one crane:

One 90-inch driving wheel tire turning lathe, motor driven.
One 44-inch capacity vertical boring mill.
One 30 x 30-inch x 6-foot standard planer.
One 20-inch swing x 12-foot bed engine lathe.
One 20-inch capacity high duty shaper.
One 36-inch heavy duty upright drilling machine.
One twist drill grinder.
One 2-inch double bolt cutter.
One pipe threading achine, capacity ⅛ to 4 inches.
One 125-ton driving box press.
One double end punch and shear.
One set of bending rolls, 6 x 62-inches.
One alligator shear to cut 2-inch rounds.
One 600-pound steam hammer.
One 5-ton Whiting, 2-motor electric crane, 36-foot span.

NEW YORK.—Sanderson & Porter, 52 William street, plans a 1-story power plant, 100 x 175 feet.

NEW YORK.—The Arrow Iron Works has been incorporated with $10,000 capital, by S. Tobias, L. Schildorout, and B. Goldberg, 610 East 133rd street.

NEW YORK.—The Merchants' Metals Corp. has been incorporated with $1,000,000 capital, by M. P. Kupfer, S. H. Kaufman and N. A. Halblum, 60 Wall street.

NEW YORK.—The United Wire Goods Mfg. Co. has been incorporated with $20,000 capital, by L. Schulbert, J. Postal and M. Halpern, 78 East 127th street.

NIAGARA FALLS, N. Y.—The U. S. Light & Heat Corp. will build a 2-story plant addition, 80 x 100 feet.

OGDENSBURG, N. Y.—The Hudson Brass Works contemplates a plant, one story, 100 x 300 feet, at a cost of $65,000.

POUGHKEEPSIE, N. Y.—The Federal Bearing Co. contemplates a plant, four stories, 105 x 137 feet.

ROCHESTER, N. Y.—The Selden Motor Co. is planning a 2-story plant addition, 100 x 140 feet.

ROCHESTER, N. Y.—Architect J. F. Ancona, 304 Cutler building, is preparing plans for a foundry, 100 x 130 feet. The name of the owner is withheld.

ROCHESTER, N. Y.—The J. H. Allen Automatic Machinery Corp. recently was incorporated with $200,000 capital, by L. J. Fess, H. U. Faring and J. H. Allen.

SYRACUSE, N. Y.—M. L. Oberdorfer, 804 East Water street, is having plans prepared for a foundry addition.

AMBRIDGE, PA.—The Ambridge Tool & Die Mfg. Co. has been organized with $20,000 capital by August Le Juene, Fair Oaks; John D. Swoboda, Leetsdale, and Charles E. Hanigan, Baden.

BRADFORD, PA.—The Amex Chemical Co. has been incorporated by C. E. McCafferty, George J. Reidy and W. A. McCafferty with $75,000 capital.

GETTYSBURG, PA.—Roy Adams, care of the Somerset Garage & Machine Co., Somerset, Pa., contemplates a foundry, 50 x 180 feet, to cost $15,000.

PHILADELPHIA.—The Keystone Auto Supply Co. has awarded a contract for a 4-story factory building, 80 x 140 feet.

PHILADELPHIA.—Additions, costing $60,000, will be erected by R. C. Ballinger & Co., for the Brown Instrument Co. Two structures will be erected, one 44 x 126 feet, and the other, 37 x 72 feet.

PITTSBURGH.—The Pittsburgh Gear & Machine Co. has plans for a machine shop to cost about $50,000.

PUNXSUTAWNEY, PA.—The Mahoning Hardware & Implement Co. has been incorporated with $50,000 capital by J. Boyd Allison, Linus M. Lewis and J. M. Williams.

SHARON, PA.—The Pennsylvania-Ohio Electric Co., formerly the Mahoning & Shenango Railway & Light Co., a subsidiary of the Republic Railway & Light Co. will build an addition this spring to its power generating station at Lowellville.

WAYNESBORO, PA.—The Victory Tool Co. has broken ground for a 1-story machine shop addition to cost $12,000.

HOBOKEN, N. J.—The White Metal Mfg. Co., 1004 Clinton street, plans two buildings, 20 x 80 feet and 135 x 135 feet.

HOBOKEN, N. J.—The William H. Atkinson Co., dredging machinery, has broken ground for a 1-story machine shop addition, 68 x 142 feet, to cost about $25,000.

JERSEY CITY, N. J.—The American Spring Mfg. Co. has had plans drawn for a plant addition.

NEWARK, N. J.—The United Automotor Parts Co., 89 Academy street, has been organized to manufacture spark plugs, etc.

NEWARK, N. J.—The Kno Soe Tool & Machinery Works has been organized to manufacture tools, etc.,

Tructractor Hauls Heavy Loads *in* Plant *and* Yard

OUTDOORS or in, industrial haulage problems are being solved by Clark Tructractors.

Solid and compact, with load carried in front, the Tructractor delivers 2,500 pounds of castings, wet concrete, coal, hot forgings—whatever needs to be hauled—exactly to the desired spot. It slips in between machines in the shop—it hauls materials on the road in construction work. Everywhere it ***saves time in delivery, labor in handling.***

Driven by gasoline and controlled just like an automobile, the Clark Tructractor is simple and economical to operate. It gives *uninterrupted* service.

An illustrated booklet showing how Clark Tructractors are solving transportation problems in many industries will be mailed on request.

CLARK TRUCTRACTOR COMPANY
1134 South Michigan Avenue, Chicago

CLARK TRUCTRACTOR

by J. Otto Semer, 138 West End avenue, and others.

PERTH AMBOY, N. J.—The Perth Amboy Iron & Metal Co. has been incorporated with $125,000 capital, by Samuel Horowitz, Bertha Jacobsen and Jacob Rusdrman.

RIVERSIDE, N. J.—The Continental Motor Co according to a report, plans a plant near here.

TRENTON, N. J.—The Crescent Insulated Wire & Cable Co. has awarded contracts for proposed additions.

TRENTON, N. J.—The Trenton Patent Mfg. Co., which was recently incorporated with $200,000 capital, will erect a plant.

BALTIMORE.—The Ellicot Machine Co., Bush street, has plans for a 1-story plant addition, 60 x 125 feet.

BALTIMORE.—The Eastern Rolling Mills Co. has purchased an adjoining tract of land for further plant expansion.

BALTIMORE.—The Marine Engineering Corp., 110 East Lexington street, has plans for a 1-story machine shop, 60 x 110 feet, to cost about $12,000.

BALTIMORE.—The Baltimore Copper Smelting & Refining Co. will erect a building to replace an old structure. The building will be one story, 204 x 330 feet.

BALTIMORE.—The Modern Electric Welding Co., 915 South Ann street, has been incorporated with $100,000 capital, by Daniel J. Lynch, John M. Hoffman and Milton Roberts.

BALTIMORE.—Work will start shortly on a plant for the Maryland Motors Corp. on a recently purchased site of 140 acres near Laurel. The company was recently organized with a capital of $2,000,000 by Baltimore interests. Paul J. Poboehl is president.

HOPEWELL, VA.—A plant will be erected here by Mayhew Steel Products, Inc., 291 Broadway, New York, manufacturer of mechanics' hand tools and automobile tool kits.

Central States Activity

APPLETON, WIS.—The Milhaupt Spring & Automobile Co., capitalized at $40,000, has been chartered to take over an existing forge and machine shop by Leo P. Milhaupt, Edgar A. Milhaupt and Conrad Milhaupt.

EAU CLAIRE, WIS.—R. D. Nuttall, president and Milton Ruppert, vice president of the R. D. Nuttall Co., Pittsburgh, are among the incorporators of the Inland American Tractor Co., organized recently to manufacture a creeper type of tractor.

KENOSHA, WIS.—The Nash Motors Co. has placed contracts for a factory building to be equipped for manufacturing open and closed bodies. The building will be 40 x 1200 feet.

MANITOWOC, WIS.—The Manitowoc Plating Works has increased its capital from $35,000 to $75,000, and contemplates a plant addition, 50 x 100 feet.

MANITOWOC, WIS.—The Eastman Mfg. Co., capitalized at $25,000, has been chartered to manufacture brass and bronze appliances by H. L. Eastman and others.

MARINETTE, WIS.—The Montana Tractor Co. is reported planning to build a plant near here, to be 175 x 250 feet, and to cost $40,000.

MILWAUKEE.—The Kohler Co. recently broke ground for a gray iron foundry, 200 x 295 feet.

MILWAUKEE.—Construction has started on additions to the local plant of the Westinghouse Lamp Co.

MILWAUKEE.—The H. W. Johns-Manville Co., 291 Clybourn street, has awarded a contract for a new plant.

MILWAUKEE.—The plant of the Milwaukee Die Casting Co., 297 Fourth street, recently was damaged by fire.

MILWAUKEE.—The Nordberg Mfg. Co. plans a machine shop addition, two stories, 60 x 112 feet, to cost $60,000.

MILWAUKEE.—The Reliance Boiler Works contemplates building a boiler shop, one story, 70 x 200 feet, to cost $40,000.

MILWAUKEE.—The American Grinder Mfg. Co. has increased its capital from $150,000 to $300,000. The plant is being enlarged.

MILWAUKEE.—The Hell Co., manufacturer of steel dump bodies, is having plans prepared for a 4-story building, 100 x 126 feet, to cost $120,000.

MILWAUKEE.—The Nordberg Mfg. Co., B. Nordberg president, Chicago and Oklahoma avenues, will build a 2-story machine shop 60 x 112 feet to cost $60,000.

MILWAUKEE.—The William Hyink & Sons Co., capitalized at $50,000, has been chartered to manufacture metalworking machinery by William Hyink Sr. and Lawrence Gazema.

MILWAUKEE.—The Modern Tool & Machine Works, capitalized at $20,000, has been chartered to manufacture tools and machinery by F. W. Kindt, Walter E. Famick and Henry J. Bendinger.

Government Inquiries

BIDS on the following equipment are desired by the navy department, bureau of supplies and accounts:

Electrical turret turning equipment, 5684, eastern and western yards, April 2.
One projectile banding press, 5702, South Charleston, March 12.
One boring and turning mill, 5703, Newport, March 19.
Three milling machines, 5704, Newport, March 19.
Four bench lathes, 5705, Newport, March 19.
Four valve reseating machines, 5713, Philadelphia, March 16.
One patternmaker's lathe, 5715, Newport, March 23.
One surface grinder, 5716, Newport, March 23.
Two milling machines, 5719, Newport, March 23.
Miscellaneous chain hoists, 5721, eastern and western yards, April 6.
One metal cutting band saw, 5732, Newport, March 23.
One surface grinder and one magnetic chuck, 5737, Newport, March 23.
Fourteen bench grinders, 5738, Newport, March 23.
One electric tier lift truck, 5742, Newport, March 23.

Schedule numbers, places of delivery and dates of openings follow the specifications of the tools.

OSHKOSH, WIS.—The Crane Co., Chicago, has purchased the business of Clough & Co., and is converting the plant into a direct factory branch.

OSHKOSH, WIS.—The Association of Commerce has induced the Oshkosh Motor Truck Co. to maintain its plant and headquarters here, and will assist in financing the construction of a new plant, 100 x 300 feet, to cost $200,000, with additional equipment. W. A. Besserdich is president.

WAUKESHA, WIS.—The Waukesha Brass Foundry Co. has a site, 170 x 300 feet, on which it will erect a plant, 50 x 200 feet, at a cost of $40,000.

WAUSAU, WIS.—The Walking Tamper Co., capitalized at $100,000, has been chartered to manufacture tools and implements by W. W. Albers, Patrick T. Stone and D. E. Sauerbering.

DETROIT.—Hall Lamp Co. will erect a factory and office addition.

DETROIT.—Hupp Motor Car Co. has five 4-story factory units in course of erection.

DETROIT.—General Aluminum Castings Co. has let contracts for a 2-story foundry at Marysville, Mich.

DETROIT.—The Russel Motor Axle Co. contemplates the erection of a heat treating building, one story, 35 x 60 feet.

DETROIT.—The J. W. Murray Mfg. Co., producers of metal motor car parts, has purchased from the L. A. Young Industries the plant of its subsidiary.

CHICAGO.—The Dole Valve Co., 208 Wells street, has awarded a contract for a 2-story plant, 100 x 123 feet, to cost $90,000.

CHICAGO.—The Stewart Warner Speedometer Co. has awarded a contract for a 6-story plant, 141 x 150 feet, to cost $400,000.

CHICAGO.—The Power Equipment Co., 343 South Dearborn street, will build a 1-story plant, 124 x 150 feet, to cost $75,000.

CHICAGO.—The Woodford Engineering Co., 118 North La Salle street, plans a 2-story machine shop, 144 x 122 feet, to cost $75,000.

CHICAGO.—The Banner Mfg. Co., 1871 Clybourne avenue, will build a machine shop, 40 x 50 feet, to cost $12,000. C. W. Lampe, 155 North Clark street, is architect.

CHICAGO.—The Ursus Mfg. Co., 1057 Milwaukee avenue, will build a plant at Grand and Fullerton avenues, consisting of four units, the first of which will be 60 x 300 feet, to cost $75,000.

DECATUR, ILL.—The Comet Automobile Co. contemplates a 4-story plant addition.

JOLIET, ILL.—James G. Heggie & Sons, Inc., ladles, kettles, etc., contemplates a 1-story plant addition, to cost about $65,000.

KEWANEE, ILL.—The Kewanee Boiler Co. is erecting an addition to its plant.

NORTH AURORA, ILL.—D. P. Sperry & Co. contemplates a foundry, 60 x 100 feet, to cost $20,000.

ANDERSON, IND.—The Anderson Machine & Tool Co. has been incorporated with $150,000 capital, by Henry P. Hardie, W. H. Bozell, Paul A. Goldsmith, William Estep and others.

ANDERSON, IND.—The Anderson Trailor Co., capitalized at $25,000, has been chartered to manufacture automobile appliances by James S. May, George S. Parker and James W. Sansbery.

EAST CHICAGO, IND.—The Mark Mfg. Co. is reported planning a machine shop.

FORT WAYNE, IND.—The Trudeau Motors Corp., capitalized at $75,000, has been chartered to manufacture gas engines and motors by C. J. Lomont, Guy Colerick, and F. L. Miller.

GARY, IND.—The Leonard Tractor Co. is having plans prepared for a plant at Griffith, Ind.

KOKOMO, IND.—The International Engineering & Mfg. Co. will establish a plant here at an estimated cost of $100,000, to be devoted to the manufacture of electric lighting power plants, etc.

INDIANAPOLIS.—The Reedy Elevator Co., D. V. Reedy president, will build a plant costing $50,000.

INDIANAPOLIS.—The Commercial & Experimental Machine Co. has been incorporated with $65,000 capital, by Edwin S. Harter, Thomas L. Wayne and Lee R. Hartley.

INDIANAPOLIS.—The Reliable Mfg. Co., capitalized at $50,000, has been chartered to manufacture metal products by Charles Ritchel, George M. Wolfe and Edward J. Kappeler.

VINCENNES, IND.—The Vincennes Foundry & Machine Shop plans to build a plant, 80 x 150 feet.

BUCYRUS, O.—The Bucyrus Malleable Casting Co.,

which was recently incorporated with $20,000, is reported planning to erect a modern plant here. Incorporators of the company are P. Browarsky, S. A. Schieber, H. A. Wyss, A. Wheeler, D. Kalb and R. V. Sears.

CINCINNATI.—The Parker Valve Co. recently was incorporated with $25,000 capital, by E. A. Williams, J. F. Parker, R. C. James, C. S. Williams and R. Collins.

CLEVELAND.—The West Steel Casting Co. contemplates the building of a plant addition.

CLEVELAND.—The Osborn Mfg. Co. has purchased a site on which it is reported planning a plant addition.

CLEVELAND.—The Klein-Patterson Body Co. has been incorporated with $15,000 capital, by E. Klein, L. Beih and others.

CLEVELAND—The Motor Rims Manufacturers Co. has been incorporated with $10,000 capital, by J. H. Smart, George Wyman, L. M. Wissell, M. E. Molner and D. Gould.

COLUMBUS, O.—The Iron Products Co. recently was incorporated with $250,000 capital, by C. C. Bowman, J. G. Westwater and J. M. Butler.

COLUMBUS, O—The Super-Heating Boiler & Furnace Co. has been incorporated with $100,000 capital, by L. H. Southard, W. R. Sayers, W. C. Southard, E. N. Huggins and J. L. Davies.

DAYTON, O.—Work has started on a foundry for the Union Metal Mfg. Co.

GENEVA, O.—The Geneva Metal Wheel Co. contemplates some new construction.

GREENVILLE, O.—The Silver Steel & Iron Co. has been incorporated with $300,000 capital, by M. J. Wise, W. B. Liggett, G. Hills, W. R. Munger and B. F. Wyatt.

JUNCTION CITY, O.—The Griggs Mill & Motor Co. has been incorporated with $50,000 capital, by G. W. Griggs, A. E. Griggs, C. T. Mercer, J. B. Elder and A. E. Lidderdale.

MIDDLETOWN, O.—The Willard-Middletown Machine Co. recently was incorporated with $1000 capital, by J. G. Hey, A. C. Dodge, F. Mendenhall and others.

TOLEDO, O.—The Deshler Foundry & Machine Co. recently was incorporated with $25,000 capital, by R. T. Garrison, E. S. Damon and others.

HUNTINGTON, W. VA.—The Ohio Valley Enameling Co. contemplates a plant, 100 x 100 feet, to cost $43,000.

Throughout the West

COUNCIL BLUFFS, IOWA.—The Griffin Wheel Co. plans a plant at an estimated cost of $500,000.

DAVENPORT, IOWA.—The Davenport Drop Forging Co. has been incorporated with a capital of $50,000, and has purchased a site on which it plans a plant.

DAVENPORT, IOWA.—The H. J. Frank Foundry & Machinery Co., Second street, has awarded a contract for a plant addition, 80 x 100 feet, to cost $25,000.

HUCKSLEY, IOWA.—Bonds for $27,000 have been voted for the installation of a waterworks system.

SIOUX CITY, IOWA.—The city is planning waterworks improvements to cost $150,000. H. C. Gray is superintendent of public improvements.

ST. LOUIS.—The Lehman Machine Co. has purchased a site on which it plans a plant.

ST. LOUIS.—The plant of the A. Kilpatrick & Son Foundry Co. recently was damaged by fire.

FT. WORTH, TEX.—The Huster Tool & Supply Co. has been incorporated with $25,000 capital, by E. Huster, H. B. Huster and William Gelder.

GALVESTON, TEX.—The Gulf Iron & Machine Co. has been incorporated with $7500 capital, by P. E. Hanson, C. K. Guebe and S. G. Allen.

HOUSTON, TEX.—The Lone Star Steel & Bridge Works, capitalized at $100,000, has been chartered to manufacture bridge and other steel materials, by George E. Cole and others.

ENID, OKLA.—The Oklahoma Foundry Products Co. will equip a plant at an etsimated cost of $85,000.

OKLAHOMA CITY, OKLA.—The Auto Chain Pull Co., capitalized at $200,000, has been chartered to manufacture chains and will build a plant. Incorporators are W. B. Smalling of Oklahoma City, J. K. Gauling and E. E. Brown of Sioux City, Iowa.

SAND SPRINGS, OKLA.—The Tulsa Stove & Foundry Co. will build a foundry addition, 72 x 320 feet, costing $50,000.

SALT LAKE CITY, UTAH.—This city is having plans prepared for enlargements to the waterworks system, which will cost $3,300,000. S. Q. Cannon is city engineer.

BREMERTON, WASH.—Swensson & Co., 4099 Arcade building, Seattle, were awarded the contract for constructing the extension to the central power plant at the navy yard, to be built at an estimated cost of $50,000.

LEAVENWORTH, WASH.—The Tumwater Light & Power Co. contemplates a modern plant.

OLYMPIA, WASH.—The Olympia Foundry Co. recently was incorporated by W. L. Phillips, William Allard and others. It will manufacture gray iron castings, but later on will also turn out brass castings.

SEATTLE.—The Gladstone Co., Hoge building, plans a 2-story, 65 x 120-foot plant, to cost $50,000.

SEATTLE.—The Moran Mfg. Co., manufacturer of pumps, will build a 2-story plant addition, 60 x 120 feet.

SEATTLE.—The plant of the Northwest Lead Co. recently was damged by fire. It has a permit to erect a frame factory building.

SPOKANE.—The Spokane & International Railroad Co. will expend $50,000 in additions and improvements to the local yards.

STANWOOD, WASH.—J. W. Akin plans to establish a foundry and machine shop here, the main structure to be 50 x 100 feet.

VANCOUVER, WASH.—It is rumored that a large electric power plant will be erected by the Northwestern Electric Co.

VANCOUVER, WASH.—The Day & Night Signal Co. has been organized with $45,000 capital, by George Christie, Joseph Carter and others, and will erect a plant for the manufacture of automobile signals, etc.

WALLA WALLA, WASH.—E. B. Hussey, engineer, Seattle, has submitted plans for a municipal hydroelectric power plant.

LA GRADE, OREG.—The Eastern Oregon Light & Power Co. will erect a steam plant.

LEBANON, OREG.—The Lebanon Electric Light & Water Co. will double the power plant.

LEBANON, OREG.—The Lebanon Electric Light & Power Co. is having plans prepared for a plant.

PORTLAND, OREG.—The Portland Stove Works, 101-14 Columbus boulevard, contemplates a plant at a cost of $15,000.

PORTLAND, OREG.—Articles of incorporation have been filed by the Automotive Electric Co., by R. G. Duke, W. R. Varner and others. The company, which is capitalized at $25,000, will manufacture electric appliances and tools.

SALEM, OREG.—Application for a permit to build a power plant on the Santiam river has been filed by Charles J. Schnabel of Portland, Oreg. The proposed plant will cost about $800,000.

WACO, OREG.—The Sherman Electric Co. has been incorporated with $200,000 capital, by Homer S. Wall, Noel B. Martin and C. M. Huddleston.

LONG BEACH, CAL.—Bonds for $500,000 have been voted for extensions to the waterworks system.

LOS ANGELES.—The Los Angeles Soap Co. contemplates a 1-story machine shop and boiler plant.

LOS ANGELES.—The Los Angeles Valveless Pump Co., 316 East Third street, has been organized by Frank Ambrose and others.

LOS ANGELES.—The Globe Tool & Mfg. Co., 2605 Stephenson avenue, has been organized by Fred Attula, Albert Check, 1211 Ingraham avenue, and others.

LOS ANGELES.—The Pacific Steel Products Co., 527 Union League building, has been organized by J. W. Van Dorn and W. C. Folsom.

LOS ANGELES.—The Western Battery Mfg. Co. has been incorporated with $50,000 capital, by F. E. Sweet, V. T. Coombs and William Kane.

LOS ANGELES.—The Guaranteed Magneto Parts Co., 2025 West Pico street, has been organized to manufacture auto parts, by D. N. Marshank and others.

LOS ANGELES.—The Wilhite Machine & Auto Works, Inc., has been incorporated with $50,000 capital, by Edwin C. Wilhite, Samuel C. Wilhite and Ferdinand Goode Jr.

LOS ANGELES.—The Automotive Appliances Co., 412 Chamber of Commerce building, has been organized to manufacture metal products, by Franklin Heywood and others.

LOS ANGELES.—The Burbank Motor Co., Marsh-Strong building, is having plans prepared for a

(Concluded on Page 816)

Sell War Machinery

BRITISH steelmakers are getting rid as quickly as possible of the machinery and munition plants which they established for the production of war material, or such parts of it as cannot be utilized for peace requirements. A sale took place on Feb. 2 at the Grimesthorpe Steel Works of Cammell Laird & Co., Ltd., under the instructions of the surplus government property disposal board. There was brisk competition between many engineering firms from all parts of the kingdom, while considerable sales were made to local engineers. A good part of the plant will be retained in the city. In some cases machinery was sold at considerably more than the original cost. A couple of geared drawing presses realized £420 ($1440.60) each, which, when they were installed three years ago, cost £180 ($714.40). There was keen bidding for 14 No. 4 capstan lathes which sold for £175 ($700.25) each. The only withdrawals were machines whose sole utility was for shell manufacture, rendering them useless for any ordinary factory requirements.

Iron and Steel Scrap Prices

Corrected to Tuesday Noon

Steel Works Scrap

HEAVY MELTING STEEL

Pittsburgh	$28.00 to 28.50
Chicago	23.00 to 24.00
Eastern Pennsylvania	25.50 to 26.50
Cleveland	25.50 to 26.00
St. Louis	23.00 to 24.00
Buffalo	26.50 to 27.50
New York (dealers)	22.00 to 22.50
Cincinnati	24.00 to 24.50
Birmingham	20.00 to 21.00
Valleys	27.00 to 27.25
Boston (dealers)	21.00 to 22.00
Detroit	22.00 to 22.50

BUNDLED SHEETS

Pittsburgh	$19.50 to 20.00
Eastern Pennsylvania	21.00 to 22.00
Cleveland	18.00 to 18.50
Buffalo	19.00 to 20.00
Cincinnati	18.00 to 19.00
St. Louis	14.00 to 14.50

STEEL RAILS, SHORT

Chicago	$28.00 to 28.50
Boston (dealers)	21.00 to 22.00
Cleveland	24.00 to 24.50
St. Louis	27.00 to 27.50
Birmingham	23.00 to 25.00
Cincinnati	24.00 to 25.00

STOVE PLATE

Pittsburgh	$32.00 to 33.00
Chicago	34.50 to 35.00
Eastern Pennsylvania	30.00 to 31.00
Cleveland	30.00 to 31.00
St. Louis	32.50 to 33.00
Buffalo	32.00 to 33.00
New York	29.00 to 30.00
Cincinnati	27.00 to 28.00
Birmingham	29.00 to 31.00
Boston	26.50 to 27.50
Detroit	28.00 to 28.50

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops.	$32.50 to 33.00
Chicago, billet and bloom crops	24.00 to 25.00
Eastern Penn. (guaranteed)	32.00 to 33.00
Buffalo	32.00 to 33.00

SHOVELING STEEL

Chicago	$23.00 to 23.50
St. Louis	22.00 to 22.50

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$29.00 to 29.50
Chicago	26.00 to 26.50
St. Louis	27.50 to 28.00

BALED SHEETS

Pittsburgh	$24.00 to 24.50
Chicago	20.00 to 20.50
Detroit	19.00 to 19.50

FROGS, SWITCHES, GUARDS

Chicago	$23.50 to 24.00
St. Louis	25.50 to 26.00
Eastern Pennsylvania	25.50 to 26.50

BOILER PLATE, CUT

Chicago, No. 1	$19.50 to 20.00
St. Louis	18.00 to 18.50

ANGLE BARS—STEEL

Chicago	$27.50 to 28.00
St. Louis	25.00 to 25.50

Iron Mill Scrap

RAILROAD WROUGHT

Pittsburgh, No. 1	$33.00 to 34.00
Pittsburgh, No. 2	28.00 to 28.50
Chicago, No. 1	29.75 to 30.25
Chicago, No. 2	26.50 to 27.00
Eastern Pennsylvania, No. 1	37.00 to 38.00
Cleveland, No. 1	31.00 to 32.00
St. Louis, No. 1	28.00 to 28.50
St. Louis, No. 2	27.00 to 27.50
Buffalo	33.00 to 34.00
Cincinnati	28.00 to 29.00
Birmingham, No. 1	22.00 to 23.00
New York, No. 1 (dealers)	32.00 to 32.50
Boston (dealers)	30.00 to 31.00

WROUGHT PIPE

Eastern Pennsylvania	20.00 to 21.00
Buffalo	21.00 to 22.00
New York (dealers)	21.50 to 22.00
Boston (dealers)	19.00 to 20.00

YARD WROUGHT

Eastern Pennsylvania, No. 1	$30.00 to 31.00

CITY WROUGHT

New York, long (dealers)	24.50 to 25.50

BUSHELING

Chicago, No. 1	$23.00 to 23.50
Chicago, No. 2	16.00 to 16.50
Cleveland, No. 1	22.00 to 22.50
Cleveland, No. 2	19.00 to 21.00
St. Louis, No. 1	24.00 to 24.50
Buffalo, No. 1	22.00 to 23.00
Cincinnati, No. 1	20.50 to 21.50
Eastern Pennsylvania, No. 1	24.00 to 25.00

MACHINE SHOP TURNINGS

Pittsburgh	$18.00 to 18.50
Chicago	14.50 to 15.00
Eastern Pennsylvania	20.00 to 22.00
Eastern Pennsylvania (Blast furn.)	19.00 to 20.00
Cleveland	15.50 to 16.00
Buffalo	17.00 to 17.50
New York (dealers)	17.50 to 18.00
St. Louis	16.00 to 16.50
Cincinnati	14.00 to 14.50
Birmingham	15.00 to 16.00
Valleys	17.50 to 18.00
Boston (dealers)	17.00 to 17.25
Boston (blast furnace) (dealers)	15.00 to 15.50
Detroit	14.00 to 14.50

CAST IRON BORINGS

Pittsburgh	$20.00 to 20.50
Chicago	15.00 to 15.50
Eastern Pennsylvania	24.50 to 25.50
Eastern Pennsylvania (chemical)	27.00 to 29.00
Cleveland	18.00 to 18.50
St. Louis	16.00 to 16.50
Buffalo	20.00 to 21.00
New York (dealers' price)	19.00 to 20.00
Cincinnati	15.00 to 16.00
Birmingham	13.00 to 15.00
Valleys	19.75 to 20.00
Boston (dealers)	19.50 to 20.50
Boston (blast furnace) (dealers)	14.00 to 14.50
Detroit	16.50 to 17.00

IRON AXLES

Pittsburgh	$46.00 to 47.00
New York (dealers)	46.00 to 47.00
Chicago	44.50 to 45.00
Eastern Pennsylvania	45.00 to 46.00
Cleveland	42.50 to 43.00
St. Louis	41.00 to 41.50
Buffalo	40.00
Cincinnati	36.00 to 37.00
Birmingham	29.00 to 31.00

IRON RAILS

Chicago	32.50 to 33.00
Cleveland	30.00 to 31.00
St. Louis	32.00 to 32.50
Buffalo	28.00 to 29.00
Cincinnati	26.00 to 27.00

PIPES AND FLUES

Chicago	19.00 to 19.50
Cleveland	25.00 to 26.00
St. Louis	21.50 to 22.00
Cincinnati	21.00 to 21.50

GRATE BARS

Chicago	34.00 to 34.50
Cleveland	30.00 to 31.00
Buffalo	24.00 to 25.00
New York	26.00 to 27.00
Eastern Pennsylvania	32.00 to 33.00
Detroit	21.00 to 22.00

FORGE FLASHINGS

Cleveland, large	$17.75 to 18.25
Chicago, small	18.50 to 19.00
Cleveland, small	21.00 to 21.50
Boston (dealers)	15.00 to 16.00

FORGE SCRAP

Chicago	26.50 to 27.00
Eastern Pennsylvania, No. 1	21.00 to 22.00
Boston	14.50 to 15.00

ARCH BARS AND TRANSOMS

Chicago	34.50 to 35.00
St. Louis	36.00 to 36.50

ANGLE BARS—IRON

Chicago	35.00 to 35.50
St. Louis	34.00 to 34.50

Iron and Steel Works Scrap

AXLE TURNINGS

Pittsburgh	$22.00 to 22.50
Eastern Pennsylvania	22.00 to 23.00
Boston (dealers)	17.50 to 18.00
St. Louis	17.00 to 17.50
Cleveland	22.50 to 23.00
Buffalo	21.00 to 22.00
Chicago	19.50 to 20.00

STEEL CAR AXLES

Pittsburgh	$35.00 to 36.00
Eastern Pennsylvania	35.00 to 36.00
Cleveland	37.50 to 38.50
St. Louis	36.50 to 37.00
Buffalo	40.00
Chicago	40.00 to 40.50
New York (dealers)	37.00 to 38.00
Birmingham	32.00 to 33.00
Boston (dealers)	29.00 to 30.00
Detroit	32.00 to 33.00

SHAFTING

Eastern Pennsylvania	36.00 to 38.00
St. Louis	33.50 to 34.00
New York (dealers)	31.00 to 32.00
Chicago	35.50 to 36.00

Iron Foundry Scrap

CAR WHEELS

Pittsburgh, iron	$40.00 to 41.00
Pittsburgh, steel	29.00 to 29.50
Chicago, iron	35.50 to 36.00
Eastern Pennsylvania, iron	42.50 to 45.00
Cleveland, iron	36.00 to 37.00
St. Louis, iron	33.50 to 34.00
Buffalo, iron	37.00 to 38.00
Birmingham, iron	29.00 to 31.00
Birmingham, tram car	29.00 to 30.00
Boston	38.00 to 39.00
Cincinnati	30.00 to 31.00
Detroit	31.00 to 31.50
New York, iron	36.00 to 37.00

NO. 1 CAST SCRAP

Pittsburgh, cupola	$40.00 to 41.00
Chicago, cupola	42.00 to 42.50
Eastern Pennsylvania, cupola	40.00 to 41.00
Cleveland, cupola	39.00 to 40.00
New York, cupola (dealers)	38.50 to 39.50
Cincinnati, No. 1, machinery, cupola (net)	34.00 to 35.00
Birmingham, cupola	31.00 to 33.00
St. Louis, railroad	39.00 to 39.50
St. Louis, agricultural	38.50 to 39.00
Buffalo	37.00 to 38.00
Boston	41.00 to 42.00
Valleys	38.00 to 39.00
Detroit	34.00 to 34.50

HEAVY CAST

New York (dealers)	35.50 to 36.50
Buffalo	27.00 to 28.00
Pittsburgh	34.00 to 35.00
Cleveland	30.00 to 30.50
Boston	33.00 to 34.00

MALLEABLE

Pittsburgh, railroad	$32.00 to 33.00
Pittsburgh, agricultural	31.00 to 32.00
Chicago, railroad	33.50 to 34.00
Chicago, agricultural	33.50 to 34.00
Eastern Pennsylvania, railroad	30.00 to 32.00
Cleveland, railroad	31.50 to 32.00
Cleveland, agricultural	27.00 to 28.00
St. Louis, railroad	28.00 to 28.50
St. Louis, agricultural	28.00 to 28.50
Cincinnati, railroad	28.00 to 29.00
Cincinnati, agricultural	28.00 to 29.00
Boston, railroad	28.00 to 29.00
Buffalo	31.00 to 32.00

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Pittsburgh district	$35.00 to 36.00
Chicago	32.00 to 32.50
Eastern Pennsylvania	35.00 to 36.00
Cleveland	34.00 to 35.00
St. Louis	31.00 to 31.50
Birmingham	31.00 to 32.00
Boston (dealers)	30.00 to 30.50

LOCOMOTIVE TIRES

Chicago	29.00 to 30.00
St. Louis	27.00 to 27.50

BOILER PUNCHINGS

Chicago	30.00 to 30.50
Eastern Pennsylvania	30.00 to 32.00

When the Scrap Market Is Dull

While seeking a more favorable market the best form in which to hold your sheet scrap, etc., and the form that always commands the best prices is the dense hydraulically compressed bundle.

Thus less storage space is required—under roof to prevent loss from corrosion; and because of greater car tonnage under minimum car rate, you add from 25% to 50% freight savings to your profits.

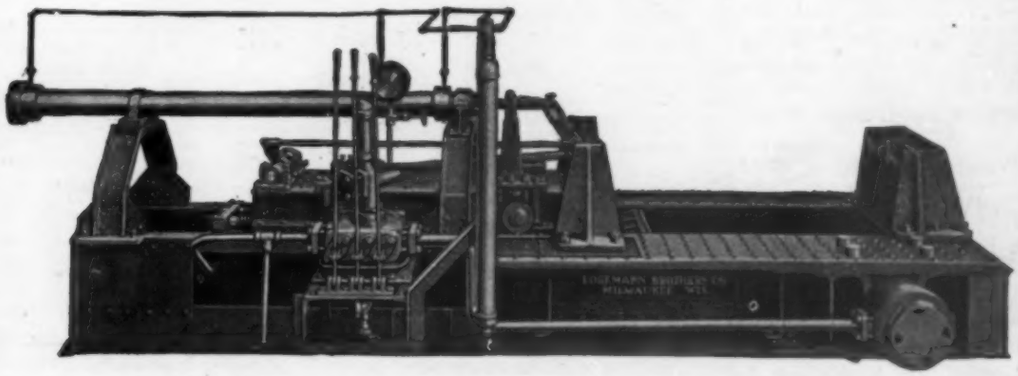
For greatest compression, largest daily output, at lowest operating cost, use

LOGEMANN Double Ram Hydraulic Scrap Metal PRESSES

You can enjoy the advantage of the accumulated experience from hundreds of Logemann scrap bundling presses now in use.

They embody a simplified mechanism that requires no special skill to operate rapidly. Press and pump are so designed that all the motive power applied is utilized, thus reducing power cost.

Powerfully built, all working parts constructed to resist the severest strains—selected material, first class workmanship—all minimize upkeep cost and insure lasting efficiency.



A medium sized press is shown; there are smaller and larger sizes in standard models.

Advise character and daily tonnage of your scrap and let us suggest press best suited to your requirements.

Logemann Brothers Co.

3126 Burleigh Street
Milwaukee, Wis.

Builders of Baling Presses and Hydraulic Machinery

(*Concluded from Page* 813)

plant to be comprised of three 1-story buildings, 50 x 145 feet, to cost $125,000.

LOS ANGELES.—The Los Angeles Trunk Hardware Co. has been incorporated with $50,000 capital, by Phillip Senegram, M. I. Phillips and J. H. Jaffe, to manufacture hardware and metal specialties.

LOS ANGELES.—The Randall Controller & Hydrometric Corp., capitalized at $500,000, has been chartered to manufacture meters and other devices by E. H. Seaver, M. M. Hartman and F. E. Trask.

STOCKTON, CAL.—The California Tractors, Inc., recently organized with $500,000 capital, has purchased a site on which it plans a tractor plant.

Business in Canada

MONTREAL, QUE.—The Canadian Tillsoil Farm Motors, Ltd., has been incorporated to manufacture tractors, etc., with $100,000 capital, by F. G. Bush, George R. Drennan, William P. Creagh and others.

MONTREAL, QUE.—The Canadian Dressler Kilns, Ltd., has been incorporated to manufacture ovens, stoves, etc., with $9000 capital, by William W. Perry, Scarboro Junction, Ont., Charles H. C. Leggott, 116 Arundel avenue, John Forbes and others.

CHATHAM, ONT.—The city engineer has recommended that the city build a new water works plant.

OTTAWA, ONT.—The Battery & Ignition Service, Ltd., has been incorporated to manufacture batteries, etc., with $20,000 capital, by Alexander Smith, William Johnston and others.

PORT ARTHUR, ONT.—The Port Arthur Sheet Metal Mfg. Co., Ltd., has been incorporated to manufacture sheet metal products, with $40,000 capital, by Arthur Whiddon, John K. Kennett, David B. Tutville and others.

SARNIA, ONT.—The H. Mueller Mfg. Co., Ltd., will increase its capital from $500,000 to $1,200,000, and plans to enlarge its business.

TORONTO, ONT.—The Canadian Lygard Engine Co. has let the general contract for a plant to cost $40,000.

TORONTO, ONT.—The foundry of Reid & Brown, 61 Esplanade street, recently was damaged by fire. It will be rebuilt.

TORONTO, ONT.—The National Motor Corp., Ltd., has been incorporated to manufacture machinery, etc., with $50,000 capital, by William L. Tobias, Henry Fenmark, Charles M. Fugua and others.

TORONTO, ONT.—Moffats, Ltd., have been incorporated to manufacture iron, steel, metals, castings, etc., with $1,000,000 capital, by James L. Ross, room 43, King street Arthur B. Mortimer and others.

TORONTO, ONT.—The Anglo-American Motors, Ltd., has been incorporated to manufacture trucks, engines, machinery, etc., with $10,000,000 capital, by John P. Ebbs, Duncan R. Kennedy, Edward R. Jackson and others.

Business Changes Recently Announced by the Trade

PHILIP P. SMITH CO., INC., has moved its offices from 20 Broadway to 25 West Broadway, New York. The company also recently has opened branch offices in Norfolk, Va., New Orleans, Philadelphia and Pittsburgh, all with warehouse accommodations. This company specializes in wire of all kinds and also deals in steel sheets, bars, angles, pipe, rails, tin plate, billets and tool steel.

* * *

Edward T. Jackman, local manager at Boston, for the Firth-Sterling Steel Co., has moved his office from 35 Oliver street, Boston, to 85 West First street, South Boston.

* * *

The Wheeling Machine & Welding Co., Wheeling, W. Va., has changed its name to the Wheeling Machine Products Co., and has increased its capital stock.

* * *

Tate, Jones & Co., Pittsburgh, furnace builders and manufacturers of oil burners, has bought out the furnace business, including the patents, drawings and good will of the American Shop Equipment Co., an offshoot of the American Brakeshoe & Foundry Co., with works at Aurora, Ill. The latter plant will be removed to Pittsburgh.

* * *

Announcement has been made of the completion of arrangements for the consolidation of the organization of the late R. Winthrop Pratt, Cleveland, with that of Morris Knowles, Inc., Pittsburgh. The Cleveland offices will be maintained, but under the name of Morris Knowles, Inc., and will be in charge of R. F. McDowell and R. E. Garvin who were continuously associated with Mr. Pratt up to the time of his death. The various branch offices of each organization will be continued.

* * *

F. R. Phillips & Sons Co., Philadelphia, iron and steel exporters and expediters, has opened temporary quarters in Room 721, William Penn hotel, Pittsburgh, with A. J. MacEwan in charge.

* * *

The W. A. Wilson Machine Co., Rochester, N. Y., planer manufacturers, has changed its name to the Morley Machine Co.

* * *

The Thomas R. Heyward Co., now located in the Farmers National Bank building, Pittsburgh, will move about the middle of this month to the Bowman building, Ross street and Second avenue, where it has secured the entire top floor.

* * *

Ford of France, Inc., 79-85 Wall street, New York City, has been appointed exclusive agent for exporting the products of the Detroit Hexagon Drill Co., Detroit.

* * *

The Newton Steel Co., Newton Falls, O., has opened an office at 356 Leader-News building, Cleveland, in charge of Howard Kenworthy.

The Titusville Forge Co., Titusville, Pa., which recently opened branch sales offices in Pittsburgh and New York, has just opened a branch office in Chicago, which is located at 80 East Jackson boulevard.

* * *

The Hunter Saw & Machine Co., Pittsburgh, has opened a branch sales office at 41 North Sixth street, Philadelphia.

* * *

The Petterson Engineering & Mfg. Co., Worcester, Mass., has changed its name to the Bilt-Rite Mfg. Co.

* * *

The Willson Goggles, Inc., is the new name for T. A. Willson & Co., Inc., Reading, Pa., manufacturer of eye protectors, etc.

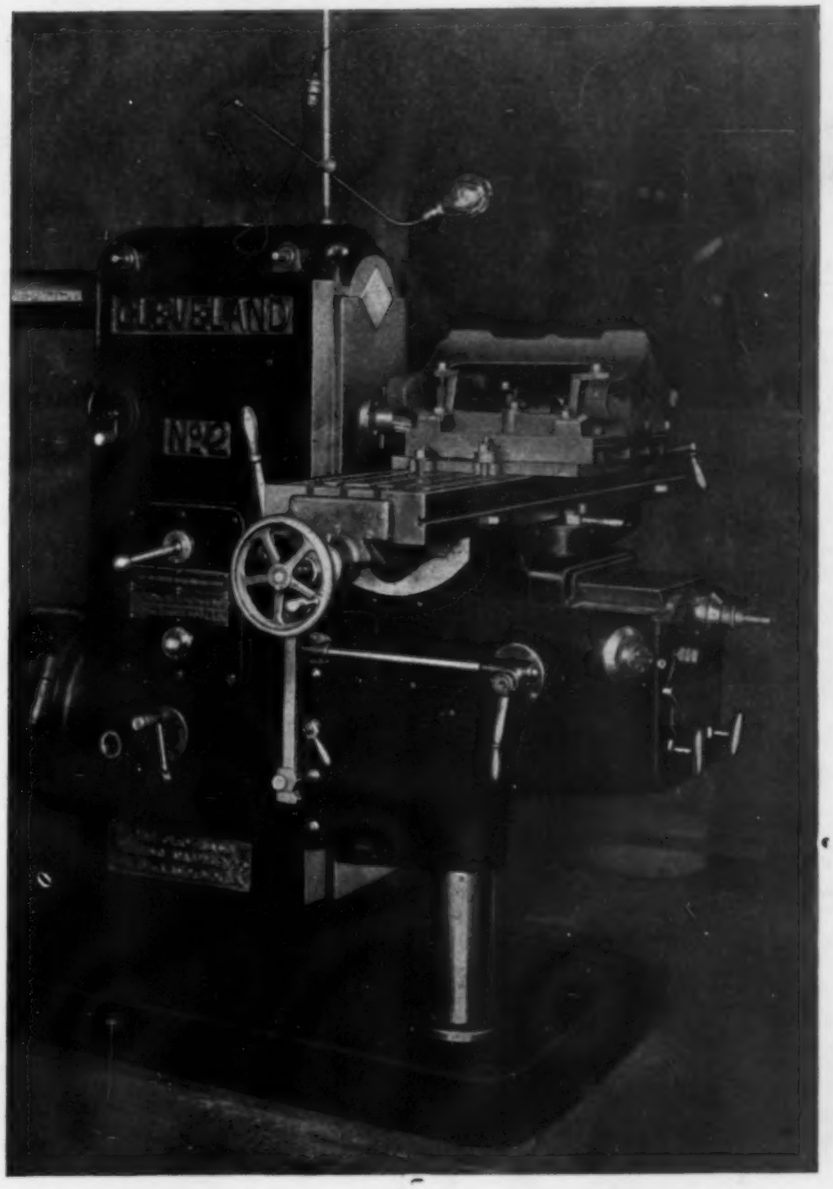
* * *

The Penn Seaboard Steel Corp., Tacony, Philadelphia, and the Amiral Anchor Co., have removed their New York offices from 111 Broadway to 2 Rector street.

* * *

The Turnbull Wagon Co., Defiance, O., organized nearly 50 years ago, added motor truck production as the demand developed, changing its name to that of the Turnbull Motor Truck & Wagon Co. Now the entire plant is being arranged for the manufacture of motor trucks and the name of the company has been changed to the Defiance Motor Truck Co.

The Cleveland Milling Machine
at the Miller Saw Trimmer Company's Plant



THE CLEVELAND MILLING MACHINE COMPANY — SC

SERVICE COURTESY

The Cleveland Milling Machine is a modern, well tried machine tool which not only embodies these cardinal features but includes some valuable special developments that are worth investigating.

Ask us about them.

Milling Cutters of Every Description

Relieving Machines
Profile Grinders
Special Tools

Send for Monthly Stock List

ACCURATE—RIGID—DURABLE
A good Milling Machine is all of these

THE CLEVELAND MILLING MACHINE COMPANY
CLEVELAND, OHIO, U. S. A.

New York Office: 1762 Woolworth Building
Detroit Office: 271 E. Jefferson Ave.
Chicago Office: 435 Stock Exchange Building
Pittsburgh Office: 203 Oliver Building

Iron and Steel Prices

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 per cent iron.....$7.45
Mesabi Bessemer, 55 per cent iron..... 7.20
Old range nonbessemer, 51½ per cent iron.. 6.70
Mesabi nonbessemer, 51½ per cent iron.... 6.55

Manganese Ore

Brazilian, 45 to 50 per cent, c.l.f. Atlantic ports, 70c to 80c per unit.

Indian, 45 to 50 per cent, c.l.f. Atlantic ports, 70c to 75c per unit, nominal.

Warehouse Prices

Steel bars, Boston	4.75c
Steel bars, Chicago	3.37c to 3.87c
Steel bars, Cleveland	3.27c to 5.00c
Steel bars, Detroit	4.085c
Steel bars, Philadelphia	4.50c
Steel bars, New York	3.37c to 4.50c
Steel bars, St. Louis	3.94c
Steel bars, Cincinnati	4.50c
Steel bars, St. Paul	3.59c to 4.095c
Steel bars, Buffalo	4.06c to 4.11c
Iron bars, Boston	4.75c
Iron bars, Buffalo	4.76c
Iron bars, Chicago	3.87c to 4.25c
Iron bars, Detroit	4.085c
Iron bars, St. Louis	3.94c to 4.32c
Iron bars, Cincinnati	4.50c
Iron bars, Philadelphia	4.50c
Iron bars, New York	4.25c to 4.50c
Shapes, Chicago	3.47c to 3.97c
Shapes, Detroit	3.935c
Shapes, Boston	4.75c
Shapes, St. Louis	3.54c to 4.04c
Shapes, St. Paul	3.695c to 4.195c
Shapes, New York	3.47c to 4.25c
Shapes, Cleveland	3.37c to 5.10c
Shapes, Philadelphia	4.25c
Shapes, Buffalo	3.91c to 3.96c
Shapes, Cincinnati	4.10c
Plates, Buffalo	4.60c
Plates, Chicago	3.67c to 4.17c
Plates, Detroit	4.135c
Plates, Boston	5.30c
Plates, St. Louis	3.74c to 4.24c
Plates, St. Paul	3.895c to 4.395c
Plates, New York	3.67c to 5.00c
Plates, Cleveland	3.57c to 5.00c
Plates, Philadelphia	5.50c
Plates, Cincinnati	5.25c
No. 10 blue anl. sheets, N. Y.	5.57c to 6.50c
No. 10 blue anl. sheets, Phila.	6.50c
No. 10 blue anl. sheets, Chicago	4.57c to 5.77c
No. 10 blue anl. sheets, Cleveland	6.25c to 7.35c
No. 10 blue anl. sheets, Boston	6.30c
No. 10 blue anl. sheets, Buffalo	5.46c to 5.51c
No. 10 blue anl. sheets, St. L.	4.64c to 5.84c
No. 10 blue anl. sheets, Cincinnati	6.00c
No. 10 blue anl. sheets, St. Paul	4.79c to 6.065c
No. 10 blue anl. sheets, Detroit	5.485c
No. 28 black sheets, Chicago	5.62c to 7.00c
No. 28 black sheets, New York	7.50c to 8.25c
No. 28 black sheets, Phila.	7.50c
No. 28 black sheets, Cleveland	7.25c to 8.15c
No. 28 black sheets, Boston	8.15c
No. 28 galv. sheets, Cincinnati	8.50c
No. 28 black sheets, Detroit	6.75c
No. 28 black sheets, St. Louis	5.69c to 7.07c
No. 28 black sheets, St. Paul	5.845c to 7.225c
No. 28 black sheets, Buffalo	7.50c
No. 28 galv. sheets, Chicago	6.97c to 8.00c
No. 28 galv. sheets, New York	8.50c to 10.00c
No. 28 galv. sheets, Phila.	10.00c
No. 28 galv. sheets, Boston	9.50c
No. 28 galv. sheets, Cleveland	8.70c to 9.50c
No. 28 galv. sheets, Cincinnati	8.50c
No. 28 galv. sheets, Detroit	8.25c
No. 28 galv. sheets, Buffalo	8.50c
No. 28 galv. sheets, St. Louis	7.04c to 8.07c
Bands, New York	4.50c to 5.50c
Bands, Boston	6.25c
Bands, Detroit	4.785c
Bands, Buffalo	4.76c to 5.16c
Hoops, Buffalo	5.96c
Hoops, Boston	7.25c
Hoops, New York	5.07c to 5.50c
Hoops, Detroit	5.025c
Cold rolled shafting, Buffalo	5.50c to 6.00c
Cold rolled shafting, New York	5.50c to 6.25c
Cold rolled shafting, Boston	6.25c
Cold rolled flats, squares and hexagons, New York	6.75c to 7.00c
Cold rolled rounds	5.50c

Mill Sheet Schedule

BLACK

Differentials for gage, per 100 pounds

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches wide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long. Extras for width and length to be added.

GALVANIZED AND LONG TERNE

Differentials for gage, per 100 pounds.

No. 30	+50c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	+15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 12-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inc., 24, 26, 28, 30 and 36 in. wide by 72, 84, 96 and 120 in. long. Extras for width and length to be added.

Freight Rates

PIG IRON

Mahoning and Shenango valleys to:

Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70
Buffalo to:	
Albany, N. Y.	$1.80
New England (rail)	3.90
New York and Brooklyn (rail)	3.90
Virginia furnaces to:	
Philadelphia	4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40
Birmingham, Ala., to:	
Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
St. Louis	$4.30
Chicago to:	
Des Moines	3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90
Ironton and Jackson, O., to:	
Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

PINISHED MATERIAL

Pittsburgh, carloads, per 100 lbs., to:

New York	27.0 cents
Philadelphia	25.0 cents
Boston	30.0 cents
Buffalo	21.0 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

BLUE ANNEALED

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 5c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.
Lengths—72-84-96-120 and 144 inches.
Extras for width and length to be added.

Tubular Goods

STEEL PIPE

Pittsburgh basing discounts to jobbers in carloads

STANDARD WEIGHT

Butt Weld	Black	Galvanized
⅛, ¼ and ⅜-inch	47 to 50½	20½ to 24
½-inch	51 to 54½	36½ to 40
¾ to 3-inch	54 to 57½	40½ to 44
Lap Weld		
2-inch	47 to 50½	34½ to 38
2½ to 6-inch	50 to 53½	37½ to 41
7 to 12-inch	47 to 50½	33½ to37
13 to 14-inch	37½ to 41	
15-inch	35 to 38½	

PLUGGED AND REAMED

Butt Weld		
1 to 3-inch	52 to 55½	38½ to 42
2-inch	45 to 48½	32½ to 36
Lap Weld		
2½ to 6-inch	48 to 51½	35½ to 39

EXTRA STRONG PLAIN ENDS

Butt Weld		
⅛, ¼ and ⅜-inch	43 to 46½	25½ to 29
½-inch	48 to 51½	35½ to 39
¾ to 1¼-inch	52 to 55½	39½ to 43
2 to 3-inch	53 to 56¼	40½ to 44
Lap Weld		
2-inch	45 to 48½	33½ to 37
2½ to 4-inch	48 to 51½	36½ to 40
4½ to 6-inch	47 to 50½	35½ to 39
7 to 8-inch	43 to 46½	29½ to 33
9 to 12-inch	38 to 41½	24½ to 28

DOUBLE EXTRA STRONG PLAIN

Butt Weld		
½-inch	39 to 42½	28½ to 32
¾ to 1½-inch	42 to 45½	31½ to 35
2 to 2½-inch	44 to 47½	33½ to 37
Lap Weld		
2-inch	37 to 40½	27½ to 31
2½ to 4-inch	39 to 42½	29½ to 33
4½ to 6-inch	38 to 41½	28½ to 32
7 to 8-inch	33 to 36½	19½ to 23

WROUGHT IRON PIPE

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

Butt Weld	Black	Galv.
⅛-inch	1	+14
¼-inch	24½	+ 2½
⅜-inch	25½	+ 1½
½-inch	29½	11½
¾ to 1½-inch	34½	18½
Lap Weld		
2-inch	28½	14½
2½ to 6-inch	30½	1[illegible]
7 to 12-inch	27½	1

PLUGGED AND REAMED
Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld		
⅛, ¼-inch	+21	+36
⅜-inch	28½	6½
½-inch	28½	15½
¾ to 1½-inch	34½	19½
Lap Weld		
2-inch	29½	16½
2½ to 4-inch	31½	19½
4½ to 6-inch	30½	18½
7 and 8-inch	22½	10½
9 and 12-inch	17½	5½

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld	Black	Galv.
½-inch	15½	3½
¾ to 1½-inch	20½	8½
Lap Weld		
2-inch	16½	4½
2½ to 4-inch	18½	9½

Lapweld Boiler Tubes

Discounts off manufacturers' standard list, in carloads; less carloads, 4 points less.

STEEL

1¼ and 2-inch	12½ to 19½
2¼-inch	17 to 24
2½ to 3-inch	23 to 30½
3½ to 4½-inch	30½ to 40½

IRON

1¼-inch	+20
2 and 2¼-inch	+10
2½ and 2¾-inch	+ 1
3 and 3½-inch	— 1½
3½ to 4½-inch	—11